NOVA SCOTIA
Department of Health

Notifiable Diseases in Nova Scotia

Surveillance Report
2003 - 2004

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Prepared by: Office of the Chief Medical Officer of Health
Nova Scotia Department of Health
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Section I

Introduction

Section I Introduction

Surveillance has been defined by the US Centers for Disease Control (CDC) as "the ongoing, systematic collection, analysis and interpretation of health data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know."[1] In Canada, surveillance of communicable diseases is supported by provincial legislation that mandates the reporting or notifying of diseases by laboratories and physicians. The list of such diseases differs by province/territory and disease-specific case definitions have been developed nationally that provide standardized criteria for reporting those diseases under national surveillance at the Centre for Infectious Disease Prevention and Control, Public Health Agency of Canada . This facilitates comparability across jurisdictions. [2]

In Nova Scotia, the Health Protection Act and the Regulations of the Act govern the reporting of communicable diseases. Notifiable communicable diseases are listed and the responsibilities of physicians and laboratories in the timely reporting of these diseases are delineated. The method of reporting is determined by the urgency of reporting the disease.[3]

This report reviews the communicable disease data collected over a 10-year period in Nova Scotia through a series of charts and tables. For diseases that have been more recently designated as reportable, data is summarized for the period 1997-2004 only. Diseases are grouped according to the national surveillance categories: Enteric, Food and Waterborne Diseases; Diseases Transmitted by Direct Contact and Respiratory Routes; Sexually Transmitted and Bloodborne Pathogens; Vectorborne and Other Zoonotic Diseases; Diseases Preventable by Routine Vaccination; and Other Diseases. It should be emphasized that the numbers cited in this report reflect only those diseases that are reported to Public Health Services and may underrepresent the true numbers of cases in the population.

Methodology

Unless otherwise indicated, all incidence rates are crude rates based on the census population of Nova Scotia in 2001 (census data supplied by the Information Analysis and Reporting Section of the Office of the Chief Information Officer, NS Department of Health). Please note that rates for the previously published 2001-2002 annual report were calculated based on the 1991 census population. The rates in the two reports therefore are not directly comparable.

Currently, Nova Scotia is composed of nine District Health Authorities (DHAs). Many of the DHAs have shared service agreements resulting in four groupings of districts that Public Health Services refer to as the regions of Western, Capital, Northern and Eastern. Geographic comparisons are made on this regional basis. Rates calculated for selected enteric, sexually transmitted and blood-borne infections for these regions in 2004 have been age-standardized to the age distribution of the 2001 census population for Canada. Cases for which age was not specified were not included in this calculation and these numbers have been noted. For selected diseases, age-specific incidence and distribution of cases by month of diagnosis are also presented. Ages have been grouped by five-year intervals for those 0 to 29 years of age, by ten-year intervals for those 30 to 59 years of age, and a single grouping has been designated for those 60 years of age and older.

Limitations

Crude Incidence Rates:

The scales on charts used to depict incidence rates in this report vary with the disease presented. Although trends may appear to show great variability, often very low rates of disease have been graphically presented and this should be noted as such.

Out-of-Province Testing:

Individuals who may reside in Nova Scotia but have previously tested positive outside of the province will not be reported here and therefore do not appear in Nova Scotia provincial statistics. Cases are attributed to the province where the initial positive diagnosis was made and where the client resided.

HIV and HCV Testing:

The number of positive HIV test reports describes those who have been tested and given a diagnosis of HIV infection but is not representative of the total number of persons living with HIV (i.e. prevalence) or the number of newly infected individuals (i.e. incidence).[4]

Similarly, the number of HCV positive reports describes those who have been tested and diagnosed as HCV positive but is not representative of all those living with HCV (prevalence) or those who are newly infected (incidence). The peak noted in 1997 is probably a reflection of increased testing through the provincial targeted programs and the resultant diagnosis of an increased number of new cases from the pool of prevalent cases.

Invasive Meningococcal Disease:

Both laboratory-confirmed and clinical cases of invasive meningococcal disease are summarized in Table 5 whereas Tables 6-15 summarize laboratory-confirmed cases only.

Section II

Enteric, Food and Waterborne Diseases

Campylobacteriosis

Campylobacteriosis is an acute zoonotic bacterial disease that affects the digestive system. The disease varies in severity and is characterized by diarrhea, abdominal pain, malaise, fever, nausea and vomiting. Infection occurs through the consumption of undercooked chicken or pork, contaminated food, water or raw milk and may also be acquired through close contact with infected infants. Infected puppies, kittens or farm animals may also be a source of the disease.[5]

The crude incidence of campylobacteriosis in Nova Scotia has shown a decreasing trend over the last decade, from 24.8 cases per 100,000 population in 1995 (Figure 1a). In 2004, approximately 66% of cases were diagnosed in individuals 30 years of age or more and 55% of cases occurred in males. Forty-nine percent of cases occurring in 2004 were diagnosed in the four-month period from May to August (Figure 1b).

Figure 1a. Incidence of Campylobacteriosis, Nova Scotia, 1995-2004

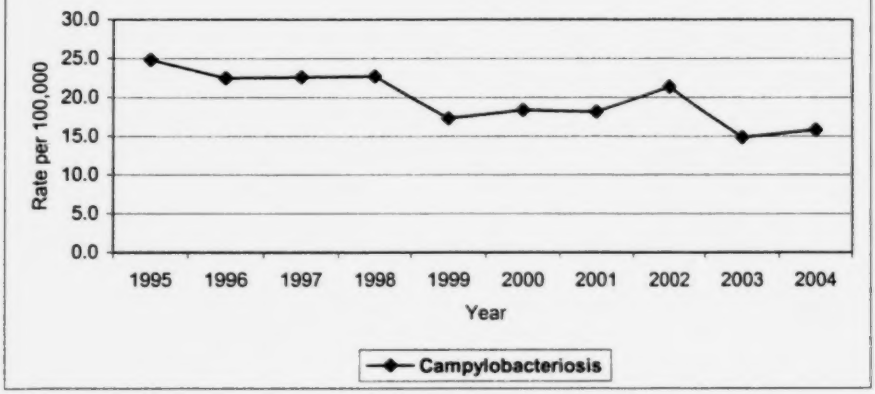
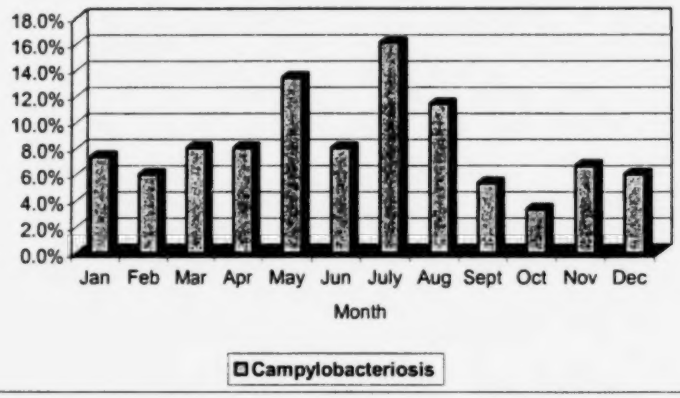


Figure 1b. Percentage of Reported New Cases of Campylobacteriosis, Nova Scotia, by Month, 2004

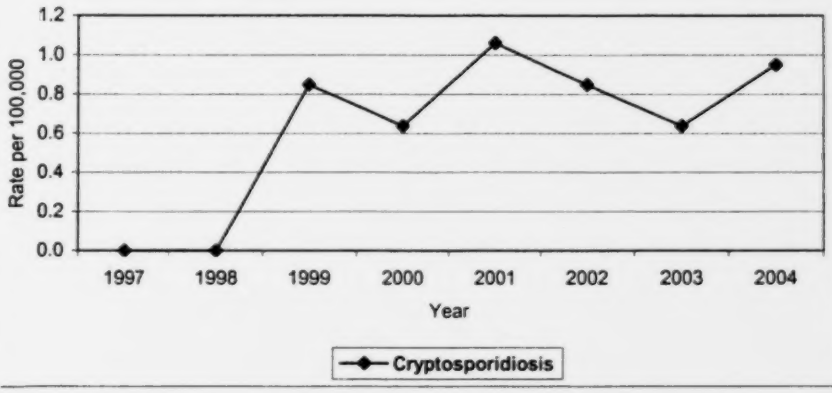


Cryptosporidiosis

Cryptosporidiosis is a parasitic infection affecting humans and more than 45 vertebrate species including poultry, birds, fish, reptiles, small and large mammals. *Cryptosporidium parvum* is associated with human infection, affecting the epithelial cells of the gastrointestinal, biliary or respiratory tracts. The disease is transmitted via the fecal-oral route and may be waterborne, foodborne, passed from person-to-person or from animal-to-person.[5]

Incidence of cryptosporidiosis infection in Nova Scotia has remained very low over the last five years with an average annual incidence of less than one case per 100,000 population (Figure 2). The apparent increase in rates post-1998 may reflect changes in laboratory testing that would have detected cases of cryptosporidiosis in addition to those for which testing for cryptosporidiosis was specifically requested.

Figure 2. Incidence of Cryptosporidiosis, Nova Scotia, 1997-2004

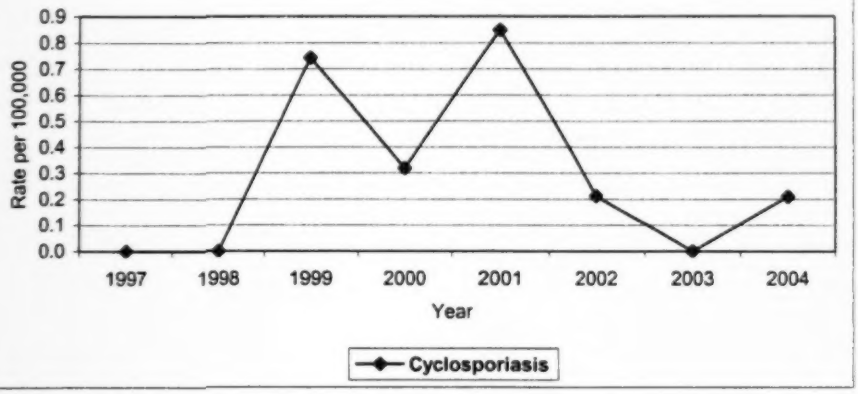


Cyclosporiasis

Cyclospora cayetanensis is a coccidian protozoan responsible for diarrheal disease. Water appears to be the main vehicle of transmission, but international outbreaks have been traced to raspberries. Basil and lettuce have also been implicated. Outbreaks are seasonal with reported cases pr .dominating in the warmer months.[5]

Incidence of cyclosporiasis has been consistently low in Nova Scotia over the past five years at less than one case per 100,000 population (Figure 3). As with cryptosporidiosis, the apparent increase in rates post-1998 may reflect changes in laboratory testing.

Figure 3. Incidence of Cyclosporiasis, Nova Scotia, 1997-2004



Giardiasis

Giardiasis is a protozoan infection, primarily of the upper small intestine. Transmission is person-to-person with the primary mode of spread probably related to hand-to-mouth transfer of cysts from the feces of infected persons (particularly in institutions and daycare centres). Ingestion of cysts in fecally contaminated water and more rarely food, may lead to localized outbreaks.[5]

The incidence of giardiasis has decreased slightly over the last decade with the exception of 1996 when incidence peaked at 15.8 cases per 100,000 population (Figure 4a). In 2004, 60% of cases were diagnosed in males. Approximately 60% of all reported cases were diagnosed in individuals 30 years of age or more and the highest age-specific incidence was in individuals 25-29 years of age (Figure 4b). Forty-six percent of cases were diagnosed between September and December (Figure 4c).

Figure 4a. Incidence of Giardiasis, Nova Scotia, 1995-2004

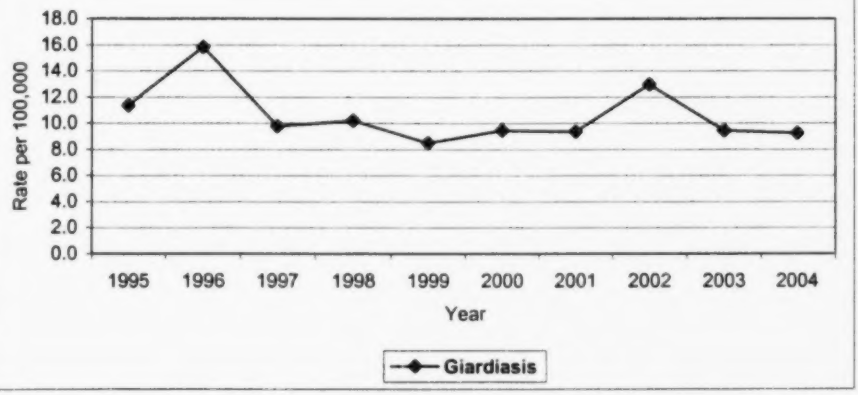


Figure 4b. Age-Specific Incidence of Giardiasis, Nova Scotia, 2004

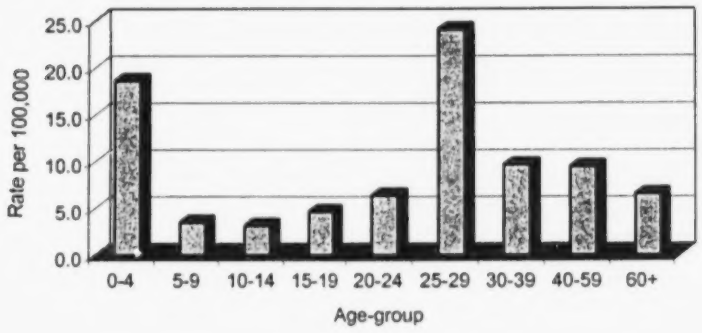
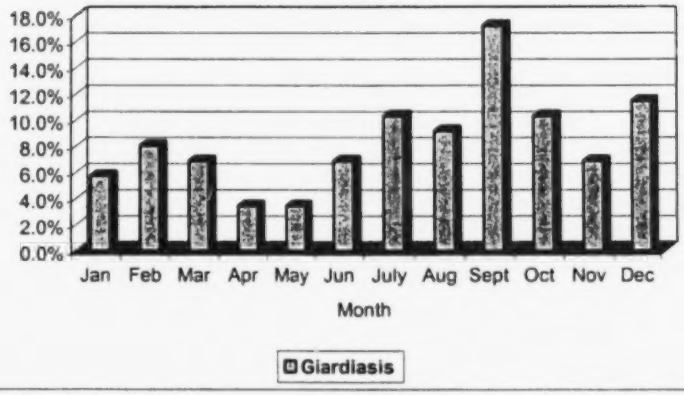


Figure 4c. Percentage of Reported New Cases of Giardiasis, Nova Scotia, by Month, 2004

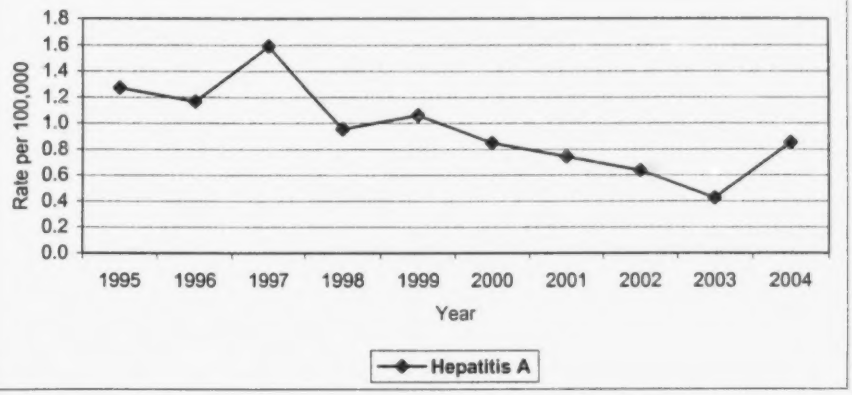


Hepatitis A

Hepatitis A Virus (HAV) is an infection of the liver caused by a picornavirus. Transmission is person to person via the fecal-oral route and common source outbreaks have been related to contaminated water and food through infected food handlers or from contaminated molluscs and produce.[5]

The incidence of HAV in Nova Scotia has remained below one case per 100,000 population since 2000 (Figure 5). In 2004, half of all reported cases were diagnosed in August but no epidemiological link was identified between any of these cases.

Figure 5. Incidence of Hepatitis A, Nova Scotia, 1995-2004

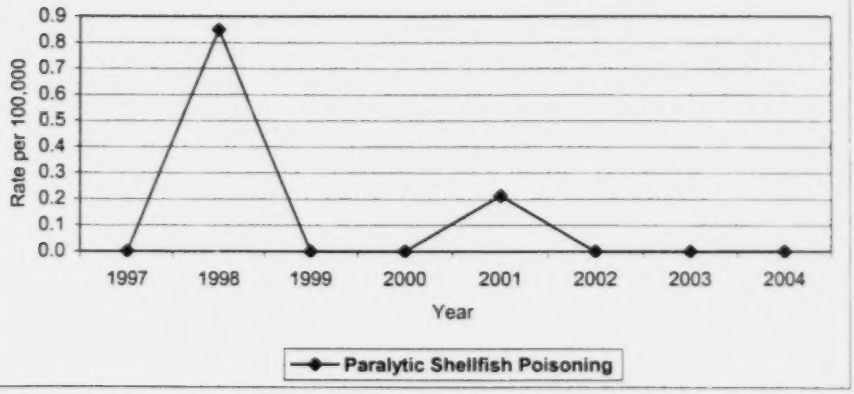


Paralytic Shellfish Poisoning

Paralytic Shellfish Poisoning (PSP) is a syndrome of characteristic symptoms predominantly neurologic in nature caused by saxitoxins present in shellfish. The saxitoxins are produced by *Alexandrium* species as well as other dinoflagellates. The onset of symptoms occurs minutes to hours following the consumption of bivalve molluscs. The toxins become concentrated especially during algae blooms that are termed "red tides" but also occur in the absence of such blooms. Once shellfish become toxic and the bloom subsides, they maintain their toxicity for a number of weeks. In some species, the toxicity is ongoing. While PSP commonly occurs in shellfish harvested from colder waters, it may also occur in tropical waters.[5]

Since 1997, PSP has been reported in Nova Scotia in both 1998 and 2001, although the incidence remains consistently low at less than one case per 100,000 population (Figure 6).

Figure 6. Incidence of Paralytic Shellfish Poisoning (PSP), Nova Scotia, 1997-2004



Salmonellosis

Salmonellosis is an enteric infection of bacterial origin. Numerous serotypes of *Salmonella* are pathogenic for animals and humans and vary in prevalence from country to country. In most areas, only a few serotypes account for most of the confirmed cases. The disease is transmitted by the ingestion of food derived from infected animals or through the fecal contamination of food from an animal or person with the disease. Potential sources of infection include raw and undercooked eggs and egg products, raw milk and raw milk products, contaminated water, meat and meat products, poultry and poultry products as well as reptiles and chicks. Raw fruits and vegetables may also be implicated if contamination occurs when the produce is sliced.[5]

The incidence of salmonellosis in Nova Scotia has remained relatively stable over the last decade, peaking at 20 cases per 100,000 population in 2001 and showing an apparent decreasing trend since that time (Figure 7a). In 2004, 63% of cases occurred in those 30 or more years of age and 55% of cases were diagnosed in females. Age-specific incidence was greatest in the 0-4 year old age group (Figure 7b). Twenty-eight percent of cases were reported in March and April (Figure 7c). It is of note that many of the reported cases of salmonella are travel-related.

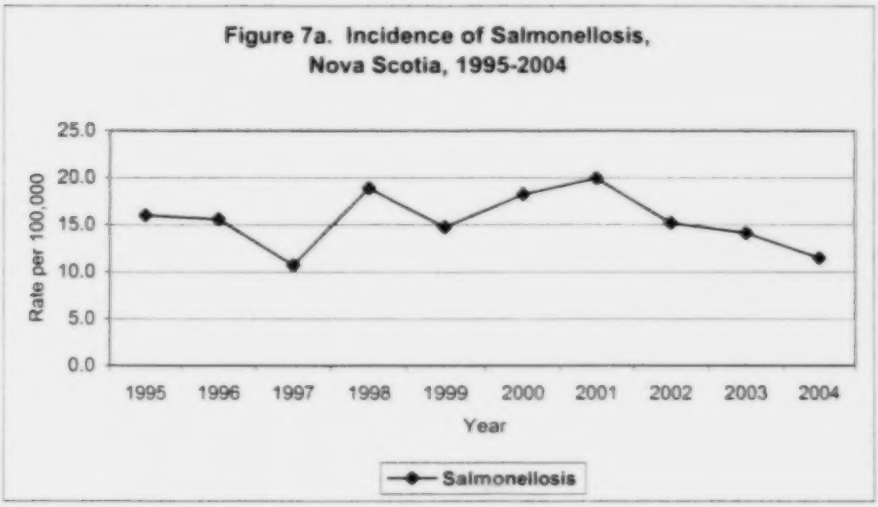


Figure 7b. Age-Specific Incidence of Salmonellosis, Nova Scotia, 2004

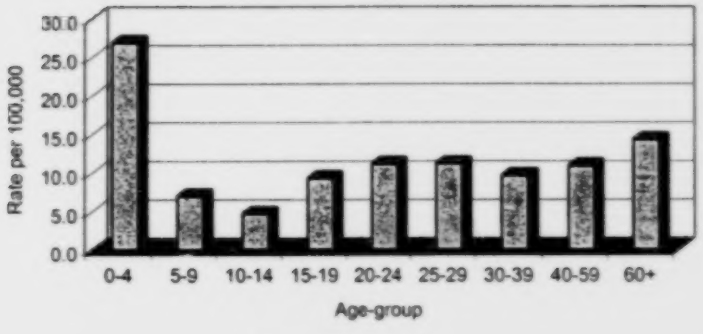
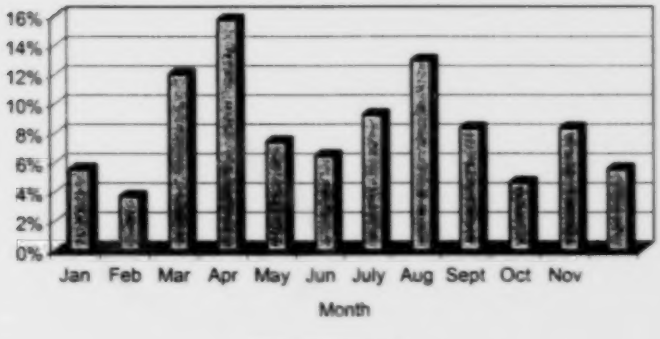


Figure 7c. Percentage of Reported New Cases of Salmonellosis, Nova Scotia, by Month, 2004



Shigellosis

Shigellosis is an acute bacterial intestinal disease caused by four species or serogroups of the genus *Shigella*. Transmission is direct or indirect from a symptomatic individual or from a short-term asymptomatic carrier via the fecal oral route. Transmission may also occur through direct fecal contamination of water and milk and through flies that may contaminate uncovered food.[5]

The incidence of shigellosis in Nova Scotia has remained consistently low over the past ten years at less than one case per 100,000 population with the exception of 2002 when incidence reached 1.6 cases per 100,000 population (Figure 8). In 2004, all reported cases were diagnosed in those 25 years of age and older. It is of note that many of the reported cases are travel-related.

Figure 8. Incidence of Shigellosis, Nova Scotia, 1995-2004

Verotoxigenic *E. coli* Infection

Infection with Verotoxigenic/Shigatoxigenic E.coli (VTEC/STEC) may lead to hemorrhagic colitis and potentially the more severe Hemolytic Uremic Syndrome (HUS), a serious complication of the infection. A common serotype in North America is 0157:H7. Transmission may be through water but commonly the infection is transmitted through contaminated food. Inadequately cooked beef (particularly ground beef), raw milk and fruits or vegetables that have been contaminated with feces from ruminants, are commonly responsible. The bacteria may also be passed person-to-person through direct contact in families, childcare centres, and institutions.[5]

The incidence of verotoxigenic *E. coli* infection in Nova Scotia peaked at 7.9 cases per 100,000 population in 1998 followed by an apparent decrease to 1.3 cases per 100,000 population in 2004 (Figure 9a). Sixty–seven percent of reported cases in 2004 were diagnosed in females and 33% of cases were diagnosed in children <20 years of age. The highest age-specific incidence occurred in those 15-19 years of age at 3.1 cases per 100,000 population (Figure 9b). Fifty percent of cases were reported between March and May (Figure 9c). The highest age-standardized rate of infection in 2004 was in DHAs 4,5,6 (Northern) at approximately 3 cases per 100,000 population (Figure 9d).

Figure 9a. Incidence of Verotoxigenic *E. coli*, Nova Scotia, 1997-2004

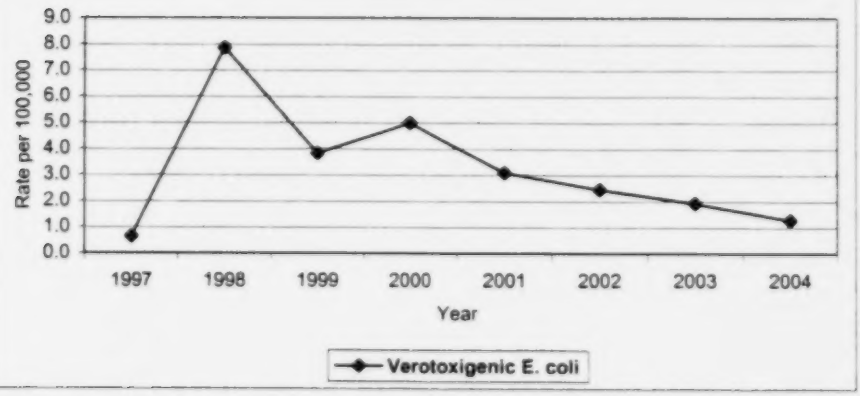


Figure 9b. Age-Specific Incidence of Verotoxigenic *E. coli*, Nova Scotia, 2004

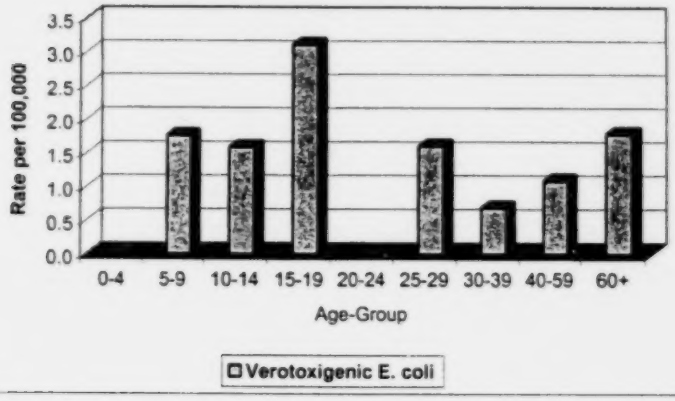


Figure 9c. Percentage of Reported New Cases of Verotoxigenic *E. coli*, Nova Scotia, by Month, 2004

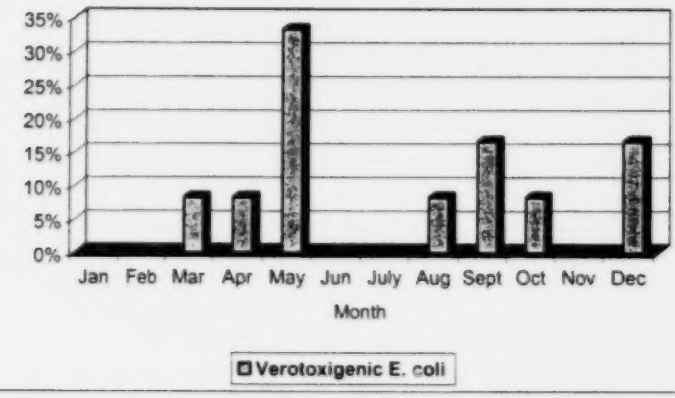
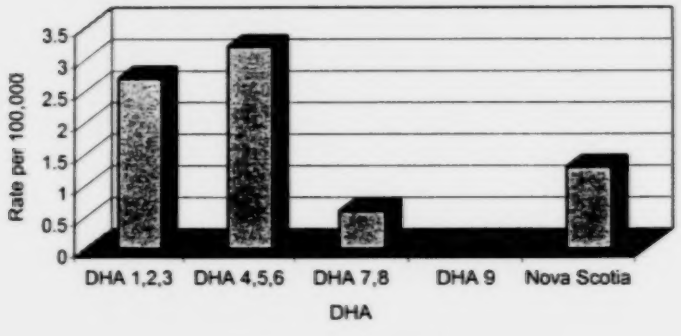


Figure 9d. Age-Standardized Incidence of Verotoxigenic *E. coli*, Nova Scotia, by District Health Authority, 2004

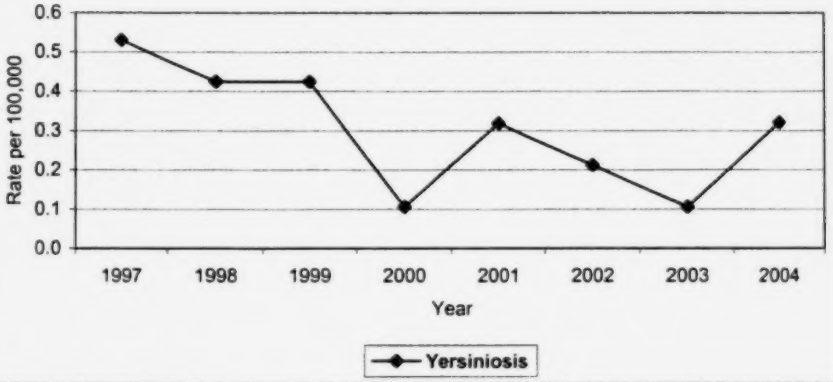


Yersiniosis

Yersiniosis is an acute enteric disease of bacterial origin. *Yersinia enterocolitica* or *Yersinia pseudotuberculosis* can both cause clinical illness but *Y. enterocolitica* is responsible for most reported cases. Transmission is via the fecal-oral route through consumption of contaminated food and water or by contact with infected humans and animals. Pathogenic strains of *Y. enterocolitica* have been most commonly isolated from raw pork or pork products.[5]

The incidence of yersiniosis in Nova Scotia has been very low over the past eight years at less than one case per 100,000 population (Figure 10).

Figure 10. Incidence of Yersiniosis, Nova Scotia, 1997-2004



Enteric Outbreaks in Nova Scotia, 1997 – 2004

Between 1997 and 2004, a total of 146 outbreaks of enteric illness were reported in Nova Scotia. Approximately 6,000 individuals were affected and three deaths occurred. The majority (73.9%) of outbreaks occurred in residential (i.e., long-term care) facilities, affecting a total of 4,929 people. Private functions and non-residential facilities accounted for 28 (19.2%) of the outbreaks and eight (5.5%) involved food services establishments.

The majority (65.1%) of the enteric outbreaks reported during this period were attributed to viral agents; 21 (14.4%) were associated with bacteria. Of the 45 (30.8%) outbreaks where the etiological agent was confirmed, the isolated organisms included: Norovirus (21), Rotavirus (10), *Salmonella* species (5), *E. coli* O157 (4), *Bacillus cereus* (3), *Clostridium difficile* (1) and *Staphylococcus aureus* (1).

Section III

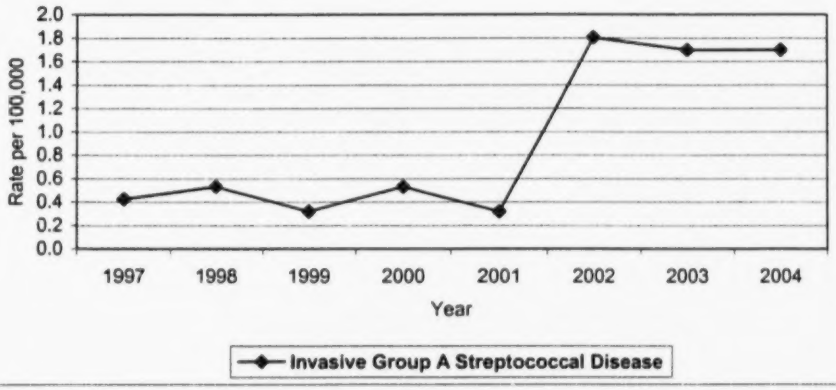
Diseases Transmitted by Direct Contact and Respiratory Routes

Group A Streptococcal Disease - Invasive

There are approximately 80 serologically distinct types of *Streptococcus pyogenes*, group A streptococci. A variety of diseases are caused by these bacteria but streptococcal sore throat and skin infections are the most commonly encountered. Other diseases include scarlet fever, puerperal fever, septicemia, erysipelas, cellulitis, mastoiditis, otitis media, pneumonia, peritonsillitis and wound infections. Rarely, infection may lead to necrotizing fasciitis, rheumatic fever and a toxic shock-like syndrome. Transmission is through large respiratory droplets or direct contact with patients or individuals who are carriers of the bacteria.[5]

Incidence of invasive Group A streptococcal disease between 1997 and 2001 was very low in Nova Scotia with an average annual rate of less than one case per 100,000 population (Figure 11). Between 2002 and 2004, incidence showed an apparent increase to approximately 1.8 cases per 100,000 which may reflect better reporting. In 2004, 94% of reported cases were diagnosed in those 25 years of age and older.

Figure 11. Incidence of Invasive Group A Streptococcal Disease, Nova Scotia, 1997-2004



Group B Streptococcal Disease of the Newborn

The human sub-types of group B streptococci (*S. agalactiae*) are responsible for two forms of illness in newborn infants. Group B streptococcal disease may have an early onset (one to seven days) and is acquired in utero or during delivery. It is characterized by sepsis, respiratory distress, apnea, shock, pneumonia and meningitis and often occurs in low-birth weight infants. The disease may also have a late onset (seven days to several months) and is characterized by sepsis and meningitis. Late onset disease is acquired by person-to-person contact and occurs in full-term infants. Case fatality for early onset disease is about 50% and approximately 25% for late onset disease.[5]

There were no cases of Group B streptococcal disease of the newborn reported in Nova Scotia between 1998 and 2000 and between 2002 and 2004. This may reflect underreporting. The incidence in 2001 was less than one case per 100,000 population.

Influenza

Laboratory-Confirmed Influenza

By May 30, 2004, a total of 357 laboratory-confirmed cases of influenza had been diagnosed in Nova Scotia during the 2003-2004 influenza season compared to 67 laboratory-confirmed cases in the 2002-2003 season. Although 2003-2004 was an active season for influenza, it should be noted that only a fraction of individuals with influenza undergo diagnostic testing. The first laboratory-confirmed case occurred early in the season on November 6, 2003 compared to the previous season when the first laboratory-confirmed case did not occur until January 21, 2003. The last laboratory-confirmed case in the 2003-2004 season occurred April 6, 2004.

Of the laboratory-confirmed cases, 63% were diagnosed in females (225) and 35% diagnosed in males (126). Cases were diagnosed in all age groups but those 65 years and older accounted for 45% of all laboratory-confirmed cases in 2003-2004. It is of note however, that this age group is more likely to undergo testing for influenza. This is a result of influenza surveillance conducted in long-term care facilities and due to the potentially serious health consequences of influenza that may occur in this older age group.

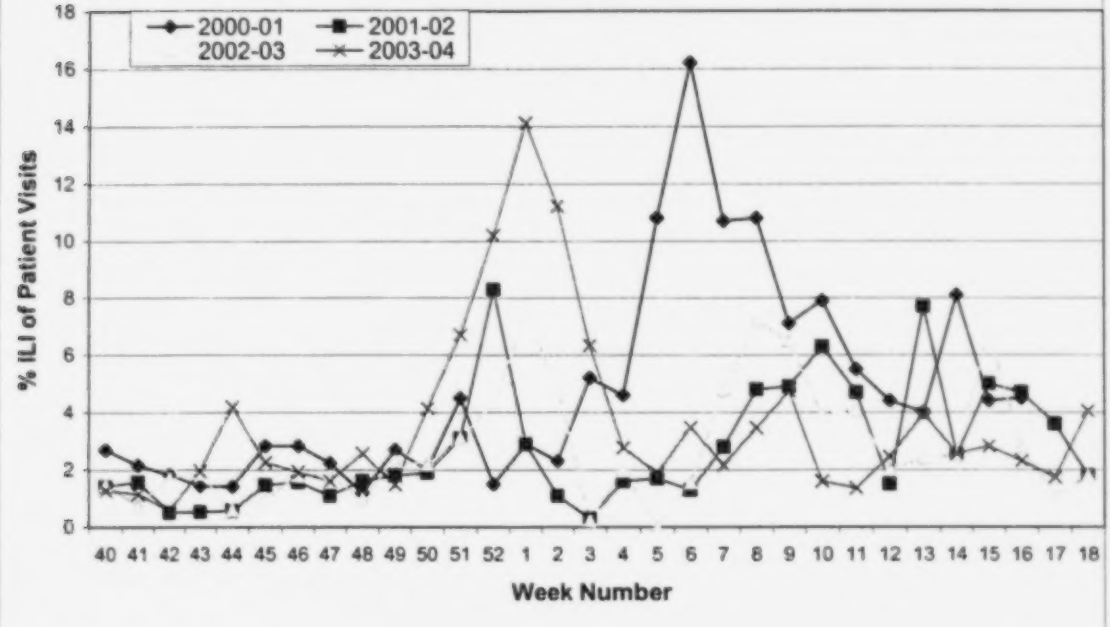
In the 2003-2004 influenza season, only Influenza A was detected in Nova Scotia, and the Fujian-like strain predominated. The number and proportion of laboratory-confirmed influenza cases by shared-service region are summarized in Table 1.

Table 1 Number and Percentage of Cases of Laboratory-Confirmed Influenza, by Type, Nova Scotia and Shared-Service Regions, October, 2003 – May, 2004

Region	Influenza A	Influenza B	Total Laboratory Confirmed Cases	
			Number	%
DHAs 1,2,3 (Western)	105	0	105	29
DHAs 4,5,6 (Northern)	35	0	35	10
DHAs 7,8 (Eastern)	77	0	77	22
DHA 9 (Capital)	140	0	140	39
Total	**357**	**0**	**357**	**100**

The rates of Influenza-like illness (ILI) for influenza seasons 2001-02 to 2003-04 are depicted in Figure 12. ILI was more severe in 2003-04 than the 2001-02 and 2002-03 seasons peaking at 14.1% of patient visits to sentinel physicians but less severe than the 2000-01 season when ILI peaked at 16.2% of patient visits.

Figure 12. Percent ILI of Patient Visits to Sentinel Physicians, Nova Scotia, for Influenza Seasons 2000-01, 2001-02, 2002-03, 2003-04, by Week Number



Outbreaks of Influenza and Influenza-like Illness in Long-Term Care Facilities

Surveillance for ILI is conducted in 91 long-term care facilities across Nova Scotia and 47 ILI outbreaks were reported in 2003-04. Influenza was laboratory-confirmed in 29 facilities. This is considerably more activity than the 2002-03 season when only one outbreak of influenza in a long-term care facility was laboratory-confirmed.

Influenza Immunization

Nova Scotia's influenza immunization program shows a consistent increase in vaccine up-take in both the high-risk groups and the general population. As seen in Table 2, over the past few years the percentage of people over 65 years of age who are immunized has increased from 58% to 72%. For those Nova Scotians under age 65 a similar trend is noted in Table 3, with a steady increase in those immunized from 8% to 19%.

The number of community-living seniors reported as receiving influenza vaccine in the 2003-04 season increased compared to the 2002-03 influenza season (Table 2) however it still remains below the national target of 80% coverage. It should be noted that because proportions calculated for this year were based on the 2001 census population rather than population projections from the 1996 census as used previously, numbers in this report may not be comparable with previous reports.

Table 2 Influenza Immunization Coverage for Nova Scotia Residents Age 65+ Years, 1998-2004

Year	Total Immunized		Total Population* 65+ Years
	Number	%	
2003-2004	85,376	72	119,017**
2002-2003	78,863	65	121,934*
2001-2002	82,352	69	120,104*
2000-2001	74,612	62	119,866*
1999-2000	73,940	63	117,358*
1998-1999	67,600	58	116,637*

*Based on mid-year projection from 1996 census, for lower year (e.g. 2002 for 2002-03 season)
** Based on 2001 census data

The immunization coverage rates for those less than 65 years of age are summarized in Table 3. Although the proportion of these individuals has increased slowly over the past few years, it is unknown how much of this increase can be attributed to those individuals at high-risk of acquiring influenza. The national target for immunization coverage of these high-risk individuals under age 65 is 80%.

Table 3 Influenza Immunization Coverage for Nova Scotia Residents < Age 65 Years, 1998-2004

Year	Total Immunized		Total Population < 65 Years
	Number	%	
2003-2004	154,927	19	816,734**
2002-2003	109,678	14	809,074*
2001-2002	103,684	13	811,217*
2000-2001	80,622	10	806,118*
1999-2000	69,130	9	805,328*
1998-1999	61,513	8	805,028*

*Based on mid-year population projection from 1996 census, for lower year (e.g. 2002 for 2002-03 season)
** Based on 2001 census data

Residents of long-term care facilities (Table 4) continued to have very high rates of influenza immunization coverage in 2003-04, almost reaching the national target of 95% immunization.

Table 4 Influenza Immunization Rate for Residents of Long-Term Care Facilities, Nova Scotia, 1999-2004

Year	Total Immunized		Total Long Term Care Population
	Number	%	
2003-2004	6545	94	6940
2002-2003	6254	94	6654
2001-2002	6638	93	7164
2000-2001	6121	91	6711
1999-2000	5329	90	5901

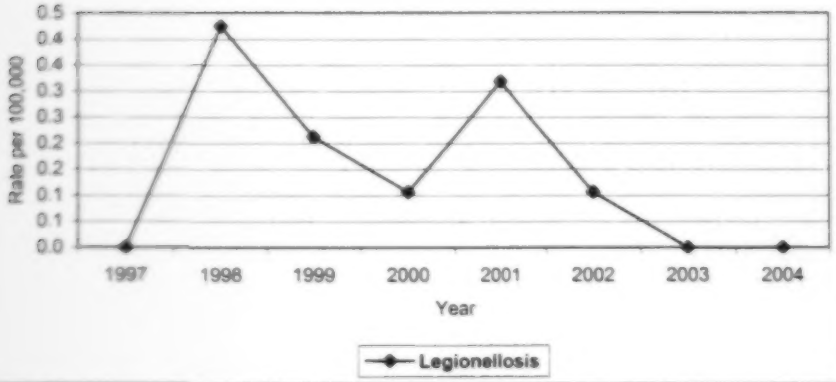
Further information may be found in the Influenza Program Annual Report, 2003-2004 prepared by the Office of the Chief Medical Officer of Health, Nova Scotia Department of Health.[6]

Legionellosis

Legionellosis is an acute disease caused by the gram-negative bacilli *Legionellae* that may lead to pneumonia or death. Water is probably the primary reservoir and epidemiologically, hot water systems (showers), cooling towers for air conditioning systems, evaporative condensers, humidifiers, whirlpool spas, equipment used in respiratory therapy, and decorative fountains have been implicated. Airborne transmission has been supported by epidemiologic evidence but the bacteria may also be transmitted by aspiration of water.[5]

The incidence of legionellosis in Nova Scotia has been extremely low with less than one new case per 100,000 population reported annually between 1998 and 2004 (Figure 13). No cases were reported in 2003 and 2004. This is probably however, an underestimation of the true number of cases in the population.

Figure 13. Incidence of Legionellosis, Nova Scotia, 1997-2004

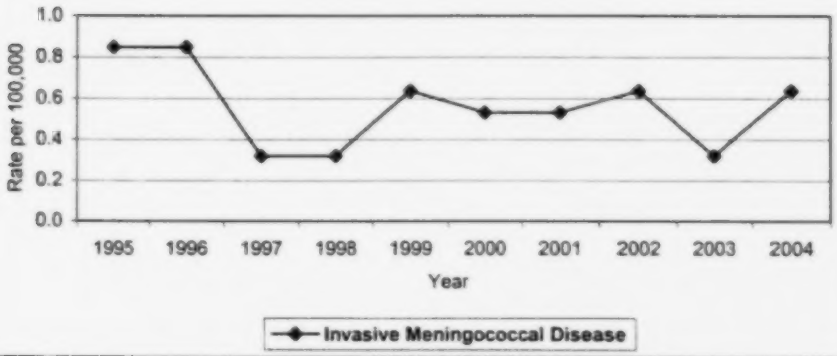


Meningococcal Disease - Invasive

Invasive meningococcal disease (IMD) is an acute bacterial disease caused by the meningococcus, *Neisseria meningitidis*. The disease is spread by direct contact and droplet infection from the nose and throat of infected individuals. The prevalence of those who carry the bacteria in the absence of meningitis or invasive disease may be 25% or more but the invasion of bacteria sufficient to cause systemic disease is uncommon. Serogroups A, B, C and Y are responsible for most cases of disease but groups W-135, X and Z have also been recognized as pathogens.[5]

Following an outbreak in 1992, overall incidence of IMD in Nova Scotia has remained consistently low (Figure 14) and since 1998 has averaged 2 cases per 100,000 population annually in children and individuals less than 20 years of age.

Figure 14. Incidence of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, 1995-2004



A total of 58 laboratory-confirmed and clinical cases of IMD were reported between 1995 and 2004 in Nova Scotia, including 5 deaths (Table 5). The highest age-specific incidence of laboratory-confirmed cases in 2004 in Nova Scotia occurred in children less than one year of age. As incidence has been shown to be highest among young children and to decline with increasing age, immunization programs generally focus on those less than 20 years of age. Laboratory-confirmed IMD, serogroup C had an incidence of 2.2 cases per 100,000 population during the outbreak in 1992, but no laboratory-confirmed cases of serogroup C were reported between 1997 and 2001. Tables 6 to 15 summarize the reported cases of laboratory-confirmed IMD from 1995 to 2004 with confirmed serogroups (B,C,Y, W-135, unknown) by age-group.

Table 5.
Number of Reported Cases of Invasive Meningococcal Disease (Laboratory-Confirmed and Clinical), Nova Scotia, by Serogroup and Outcome, 1995-2004

YEAR	TOTAL NUMBER CASES	CASE						OUTCOME	
		Confirmed with Serogroup					Clinical		
		B	C	Y	W-135	Unknown		Recovered	Died
1995	8	3	2	-	-	3	-	8	-
1996	8	3	3	1	-	1	-	8	-
1997	3	1	-	-	-	2	-	1	2
1998	4	3	-	-	-	-	1	4	-
1999	6	5	-	1	-	-	-	5	1
2000	5	2	-	1	-	2	-	4	1
2001	7	1	-	2	-	2	2	7	-
2002	8	3	1	2	-	-	2	7	1
2003	3	1	1	1	-	-	-	3	-
2004	6	4	-	-	1	1	-	6	-
Total	**58**	**26**	**7**	**8**	**1**	**11**	**5**	**53**	**5**

Tables 6-15 Reported Number of Laboratory –Confirmed Cases of Invasive Meningococcal Disease, Nova Scotia by Age-Group and Serogroup, 1995-2004

Table 6. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 1995

Year	Age-Group	CASE						
1995		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate*
	0-4	1	-	-	-	-	1	2.1
	5-9	-	-	-	-	-	-	-
	10-14	-	1	-	-	1	2	3.2
	15-19	-	-	-	-	-	-	-
	20-24	-	-	-	-	-	-	-
	25-29	-	1	-	-	-	1	1.6
	30-39	1	-	-	-	-	1	0.7
	40-59	-	-	-	-	1	1	0.4
	60+	1	-	-	-	1	2	1.2
	Total	**3**	**2**	**-**	**-**	**3**	**8**	**0.8**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 7. Number of Reported Cases of Laboratory-Confirmed Invasive meningococcal disease, Nova Scotia, by Age-Group and Serogroup, 1996

Year	Age-Group	CASE						
1996		Confirmed with Serogroup						
		B	C	Y	W135	Unknown	Total	Rate
	0-4	3	2	1	-	-	6	12.4
	5-9	-	-	-	-	1	1	1.8
	10-14	-	-	-	-	-	-	-
	15-19	-	1	-	-	-	1	1.6
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	-	-	-	-	-	-	-
	Total	**3**	**3**	**1**	**-**	**1**	**8**	**0.8**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 8. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 1997

Year	Age-Group	CASE						
1997		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	1	-	-	-	1	2	4.1
	5-9	-	-	-	-	-	-	-
	10-14	-	-	-	-	-	-	-
	15-19	-	-	-	-	1	1	1.6
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	-	-	-	-	-	-	-
	Total	**1**	**-**	**-**	**-**	**2**	**3**	**0.3**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 9. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 1998

Year	Age-Group	CASE						
1998		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	2	-	-	-	-	2	4.1
	5-9	-	-	-	-	-	-	-
	10-14	1	-	-	-	-	1	1.6
	15-19	-	-	-	-	-	-	-
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	-	-	-	-	-	-	-
	Total	**3**	**-**	**-**	**-**	**-**	**3**	**0.3**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 10. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 1999

Year	Age-Group	CASE						
1999		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	1	-	-	-	-	1	2.1
	5-9	1	-	-	-	-	1	1.8
	10-14	1	-	-	-	-	1	1.6
	15-19	1	-	-	-	-	1	1.5
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	1	-	1	-	-	2	0.7
	60+	-	-	-	-	-	-	-
	Total	**5**	**-**	**1**	**-**	**-**	**6**	**0.6**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 11. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 2000

Year	Age-Group	CASE						
2000		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	1	-	-	-	-	1	2.1
	5-9	-	-	-	-	1	1	1.8
	10-14	-	-	-	-	-	-	-
	15-19	1	-	1	-	-	2	3.1
	20-24	-	-	-	-	1	1	1.6
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	-	-	-	-	-	-	-
	Total	**2**	**-**	**1**	**-**	**2**	**5**	**0.5**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 12. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 2001

Year	Age-Group	CASE						
2001		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	-	-	-	-	-	-	-
	5-9	-	-	1	-	-	1	1.8
	10-14	-	-	1	-	1	2	3.2
	15-19	1	-	-	-	1	2	3.1
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	-	-	-	-	-	-	-
	Total	**1**	**-**	**2**	**-**	**2**	**5**	**0.5**

Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 13. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 2002

Year	Age-Group	CASE						
2002		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	2	-	-	-	-	2	4.1
	5-9	-	-	-	-	-	-	-
	10-14	-	-	1	-	-	1	1.6
	15-19	1	1	-	-	-	2	3.1
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	-	-	1	-	-	1	0.6
	Total	**3**	**1**	**2**	**-**	**-**	**6**	**0.6**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 14. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 2003

Year	Age-Group	CASE						
2003		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	1	-	-	-	-	1	2.1
	5-9	-	-	-	-	-	-	-
	10-14	-	-	-	-	-	-	-
	15-19	-	1	-	-	-	1	1.5
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	-	-	1	-	-	1	0.6
	Total	**1**	**1**	**1**	**-**	**-**	**3**	**0.3**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Table 15. Number of Reported Cases of Laboratory-Confirmed Invasive Meningococcal Disease, Nova Scotia, by Age-Group and Serogroup, 2004

Year	Age-Group	CASE						
2004		Confirmed with Serogroup						
		B	C	Y	W-135	Unknown	Total	Rate
	0-4	1	-	-	1	-	2	4.1
	5-9	-	-	-	-	-	-	-
	10-14	-	-	-	-	-	-	-
	15-19	2	1	-	-	-	3	4.7
	20-24	-	-	-	-	-	-	-
	25-29	-	-	-	-	-	-	-
	30-39	-	-	-	-	-	-	-
	40-59	-	-	-	-	-	-	-
	60+	1	-	-	-	-	1	0.6
	Total	**4**	**1**	**-**	**1**	**-**	**6**	**0.6**

*Rates per 100,000 population based on 2001 census population of Nova Scotia

Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Surveillance for MRSA has been ongoing since January, 1995 under the Canadian Nosocomial Infection Surveillance Program (CNISP) conducted by sentinel hospitals in Canada. Between 1995 and 2003, the rates of MRSA increased in CNISP hospitals from 0.46 cases per 1,000 admissions to 5.10 per 1,000 admissions (P = 0.002). Increases were noted across the country but most occurred in Ontario and Quebec. Although the rates of MRSA remain low in the Atlantic provinces, they recently appear to have increased significantly. While much of the observed increase in the detection of MRSA may be attributed to screening programs in hospitals, a five-fold increase in the rates of MRSA infections has also occurred.[7]

The incidence of MRSA in Nova Scotia has been steadily increasing from a rate of 3.6 cases per 100,000 in 1997 to 44.1 cases per 100,000 in 2004 (Figure 15a). It should be noted however that accompanying this increase in incidence has been a marked increase in testing and positive tests may reflect patients who are not only infected with MRSA but also those who are colonized with MRSA. In 2004, DHA9 (Capital) had the highest age-standardized incidence at 86.7 cases per 100,000 population (Figure 15b).

Figure 15a. Incidence of Methicillin-Resistant Staphylococcus aureus (MRSA), Nova Scotia, 1997-2004

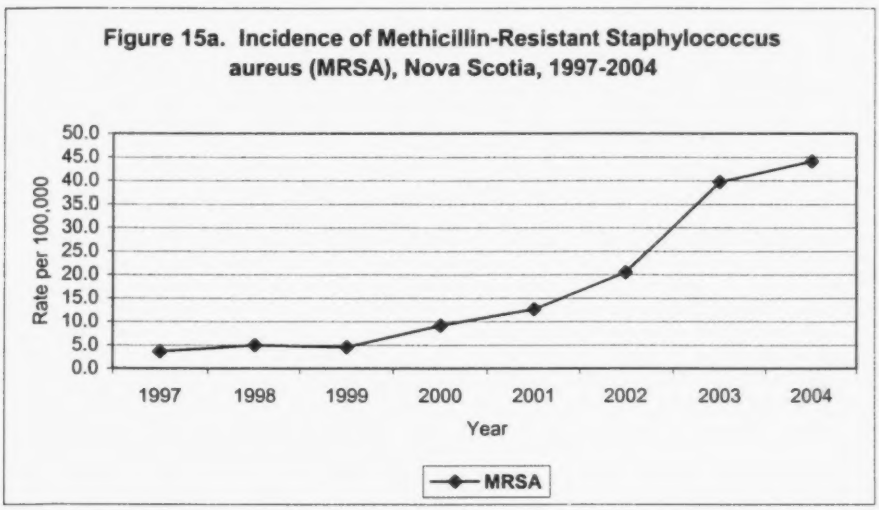
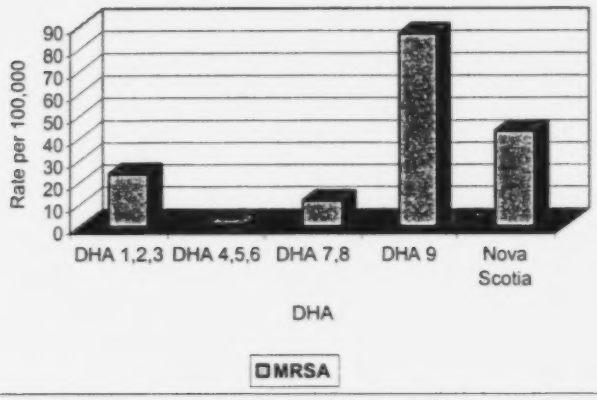


Figure 15b. Age-Standardized Incidence of MRSA, Nova Scotia, by District Health Authority, 2004

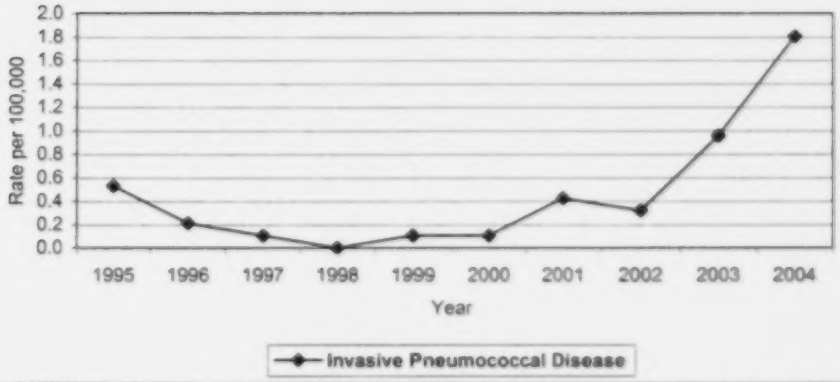


Pneumococcal Disease - Invasive

Invasive pneumococcal disease is an acute bacterial disease caused by *Streptococcus pneumoniae* (pneumococcus). It is the leading cause of invasive bacterial infections, meningitis, bacterial pneumonia and acute otitis media in children. Invasive disease is most commonly diagnosed in the very young, the elderly and those groups at high risk of disease (functional or anatomic asplenia, congenital or acquired immune deficiency including AIDS).[8] The infection is transmitted by droplet spread, direct oral contact or through indirect contact with articles freshly contaminated with respiratory discharges. Pneumococcal vaccine is available for infants and the elderly.

The incidence of invasive pneumococcal disease in Nova Scotia remained low between 1995 and 2003 with an annual incidence of less than one case per 100,000 population. In 2004, although the rate had apparently increased, it remained low at 1.8 cases per 100,000 population (Figure 16).

Figure 16. Incidence of Invasive Pneumococcal Disease, Nova Scotia, 1995-2004



Tuberculosis

Tuberculosis is a bacterial disease caused by *Mycobacterium tuberculosis* complex including *M. tuberculosis* and *M. africanum* primarily from humans and *M. bovis* primarily from cattle. Although tuberculosis may affect any organ or tissue, pulmonary tuberculosis is the most common form of the disease. Tubercule bacilli are transmitted in airborne droplet nuclei through coughing, sneezing, etc. by individuals with pulmonary or laryngeal tuberculosis. Exposure to tuberculous cattle can result in bovine tuberculosis.[5]

The incidence of new active and relapsed cases of tuberculosis in Nova Scotia has declined from recent years (Figure 17a). In 2004, there were no cases reported in the 0-20 year age group (Figure 17b) and 80% of reported cases were diagnosed in males.

Figure 17a. Incidence of New and Relapsed Cases of Tuberculosis, Nova Scotia, 1995-2004

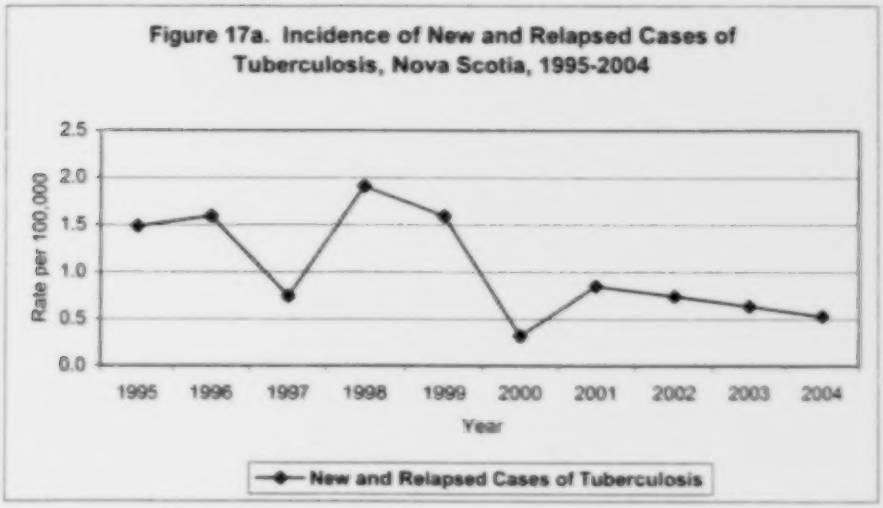
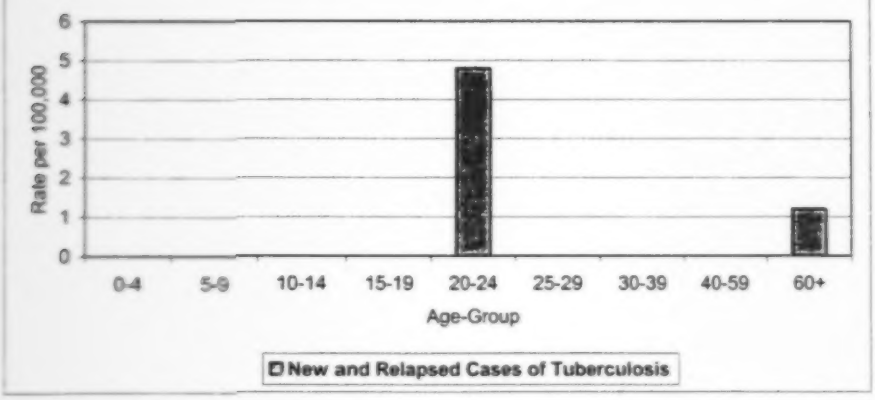


Figure 17b. Age-Specific Incidence of New and Relapsed Cases of Tuberculosis, Nova Scotia, 2004

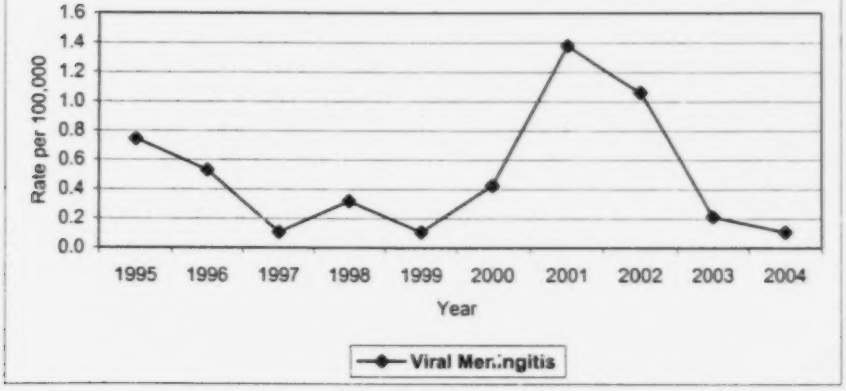


Viral Meningitis

Viral meningitis is a clinical syndrome with meningeal features caused by a number of viruses. It is comparatively common but seldom with serious consequences, with more than 50% of cases having no demonstrable etiology. In the United States, enteroviruses (picornaviruses) are responsible for the majority of cases of known etiology. Certain types of Coxsackievirus group B and echovirus cause one-third and one-half of cases respectively. The mode of transmission varies with the infectious agent.[5]

Since 1995, the incidence of viral meningitis in Nova Scotia has remained very low at less than one case per 100,000 population with the exception of 2001 when the rate was 1.4 cases per 100,000 (Figure 18). This may underrepresent the true number of cases in the population.

Figure 18. Incidence of Viral Meningitis, Nova Scotia, 1995-2004

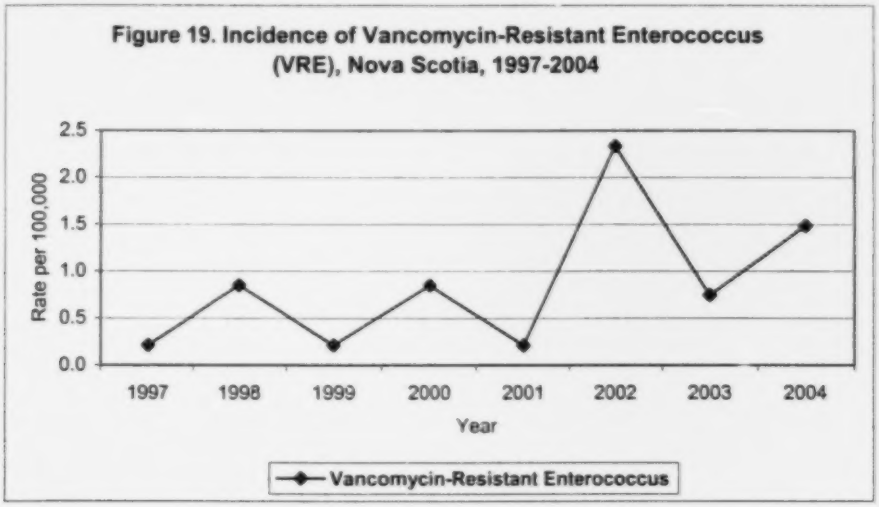


Vancomycin Resistant Enterococcus (VRE)

Enterococcus species are now acknowledged as important nosocomial pathogenic organisms.[9] While recognized as causing endocarditis for nearly a hundred years, they have been recognized recently as a cause of nosocomial infection and "superinfection" in patients who have received antimicrobial agents. In the past 20 years, the emergence of enterococci is, in many ways, attributable to their resistance to a number of commonly used antimicrobial agents (aminoglycosides, aztreonam, cephalosporins, clindamycin, semi-synthetic penicillins nafcillin, oxacillin and trimethoprim-sulfamethoxazole).[10] In 1986, the first report of vancomycin-resistant enterococci (VRE) was made in the United States, almost 30 years following the clinical introduction of vancomycin. This occurrence of VRE was probably prompted by the use of orally administered vancomycin in hospitals in the treatment of antibiotic-associated diarrhea. Of all vancomycin-resistant enterococci recovered in the United States, more than 95% are *E. faecium* and all show resistance to high levels of ampicillin.[11]

The incidence of VRE in Nova Scotia was consistently low between 1997 and 2001 at less than one case per 100,000 population (Figure 19). Recent apparent increases may reflect increased testing.

Figure 19. Incidence of Vancomycin-Resistant Enterococcus (VRE), Nova Scotia, 1997-2004

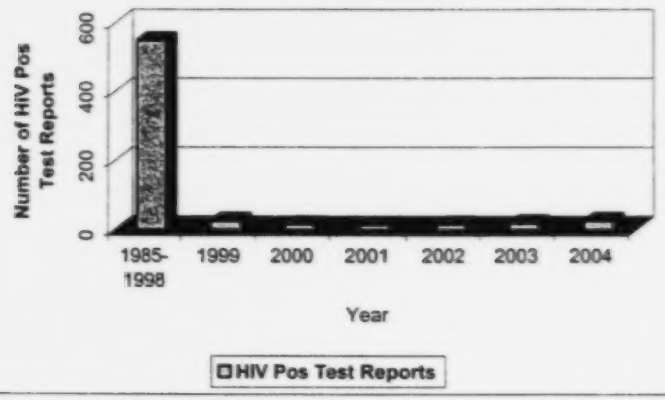


Human Immunodeficiency Virus (HIV) Infection

Two types of the Human Immunodeficiency Virus (HIV) have been identified: type 1 (HIV-1) and type 2 (HIV-2) but type 2 is less pathogenic.[5] Person-to-person transmission of the virus, can be through sexual contact, sharing HIV contaminated needles and syringes, transfusion of HIV infected blood or blood components, and transplantation of tissues or organs that have been infected with HIV.[5]

The number of positive HIV test reports describes those who have been tested and given a diagnosis of HIV infection but is not representative of all those infected and living with HIV (e.g. prevalence) or the number of newly infected individuals on a yearly basis (e.g. incidence). Between 1985 and 2004, there were 668 new HIV-positive tests reported in Nova Scotia and Prince Edward Island (Figure 20).[4]

Figure 20. Number of HIV Positive Test Reports, Nova Scotia and Prince Edward Island, 1985-2004



Section IV

Sexually Transmitted and Bloodborne Pathogens

Acquired Immunodeficiency Syndrome (AIDS)

AIDS is a disease syndrome representing the late clinical stage of infection with the Human Immunodeficiency Virus (HIV).

Between 1979 and 2004, there were 317 reported cases of AIDS in Nova Scotia and Prince Edward Island. The number has shown a continuous decline since 1995 (Figure 21a). The most common risk group identified over this time period is "men who have sex with men" (Figure 21b).[4]

Figure 21a. Number of Reported Cases of AIDS, Nova Scotia and Prince Edward Island, 1979-2004

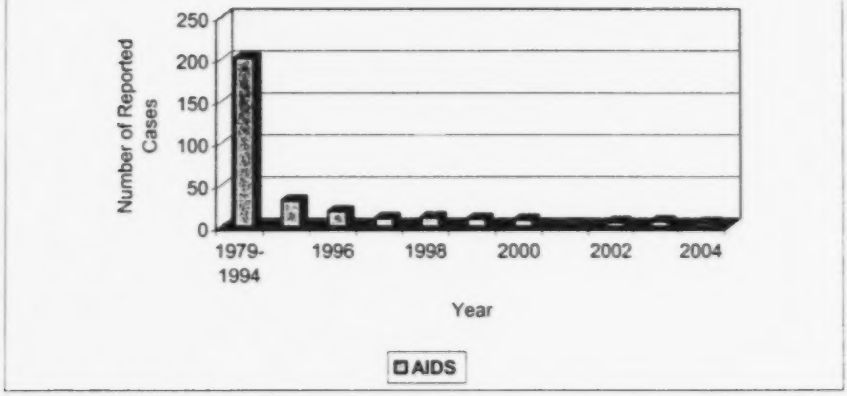
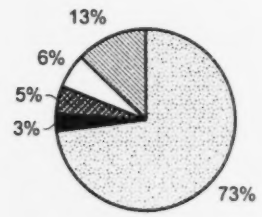


Figure 21b. Percentage of Reported Cases of AIDS, Nova Scotia and Prince Edward Island, by Most Common Exposure Categories, 2004



Percentages based on total reports minus reports with no identified risk (4 reports). Other exposure categories: Occupational exposure: 0.0%; Perinatal exposure: 0.0%; Other 0.3%;

Genital Chlamydial Infection

Chlamydiae cause a number of sexually transmitted infections and eye and lung infections of infants consequent to maternal genital infection. Genital chlamydial infection is a sexually transmitted disease caused by the bacterium *Chlamydia trachomatis*, manifested in males mainly as a urethitis and in females primarily as a mucopurulent cervicitis.[5]

Recent increasing incidence rates of chlamydial infection probably reflect to a large degree, changes in testing methodology. The number of *Chlamydia trachomatis* infections in Capital Health Region showed a marked increase in 2001 coincidental with the replacement of an enzyme immunoassay (EIA) method of testing with a more sensitive polymerase chain reaction (PCR) method at the Microbiology Laboratory of the Queen Elizabeth II Health Sciences Centre. Therefore, while rates may have increased (Figure 22a), much of this increase can be attributed to this more sensitive testing.[12]

Rates of reported new cases in females far exceeded the rates in males in 2004 in both the 15-19 and 20-24 year age groups (Figure 22b) and seventy-five percent of all reported new cases were diagnosed in females. This may be reflective of more females undergoing testing. The greatest proportion of cases in 2004 (74%) was diagnosed in the 15 to 24 year age group and DHA 9 (Capital) reported the highest age-standardized incidence of 200 cases per 100,000 population. Females in Capital had an age-standardized incidence of 286 per 100,000 population (Figure 22c).

Figure 22a. Incidence of Chlamydial Infection, Nova Scotia, 1995-2004

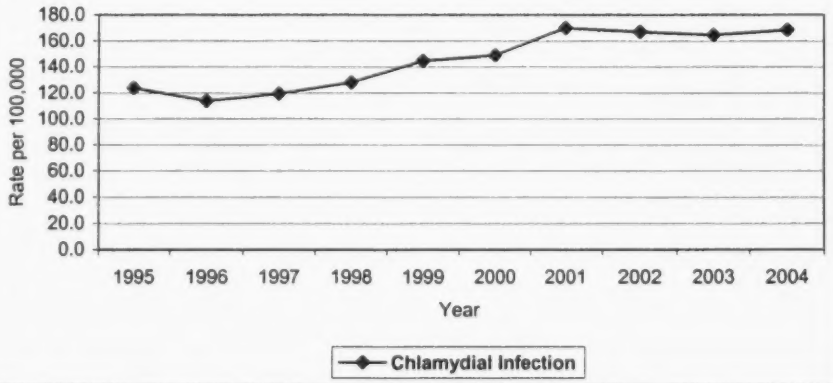


Figure 22b. Age-Specific Incidence of Chlamydial Infection, Nova Scotia, by Sex, 2004

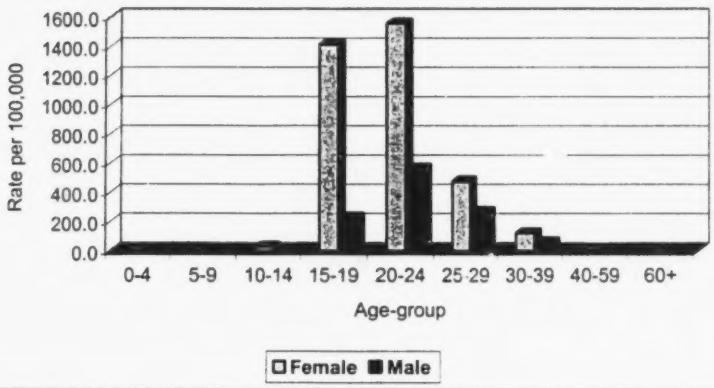
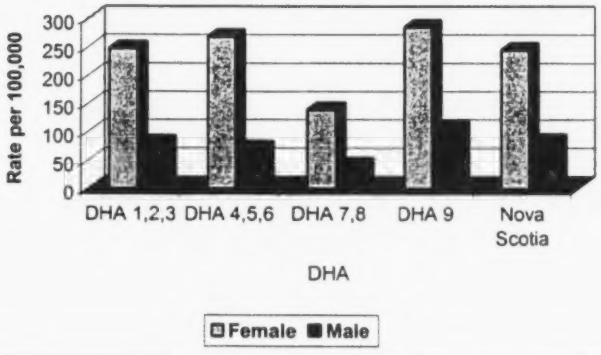


Figure 22c. Age-Standardized Incidence of Chlamydial Infection, Nova Scotia, by Sex and District Health Authority, 2004



Gonorrhea

Gonorrhea is a sexually transmitted infection caused by the gonococcus *Neisseria gonorrhoea.* It causes genital infections in males and females and can cause conjunctivitis in newborns potentially leading to blindness if not quickly and adequately treated.[5]

In 2002, the incidence of gonorrhea in Nova Scotia peaked at 21 cases per 100,000 population, and has approximated 13 cases per 100,000 population since that year (Figure 23a). This sharp peak in incidence may reflect, to some degree, the consolidation of testing in Capital District Health Authority to one site in Halifax that permitted extended hours for testing. In 2004, 62% of reported cases were individuals 15 to 24 years of age and approximately 56% of cases were diagnosed in females. Although age-specific incidence in 2004 was highest in the 20-24 year old age-group at 69 cases per 100,000, females 15 to 19 years had an age-specific incidence of 87 cases per 100,000 (Figure 23b). DHA9 (Capital) had the highest age-standardized incidence of 25 cases per 100,000 population and females in Capital region had an age-standardized incidence of 26.6 cases per 100,000 (Figure 23c).

Figure 23a. Incidence of Gonorrhoea, Nova Scotia, 1995-2004

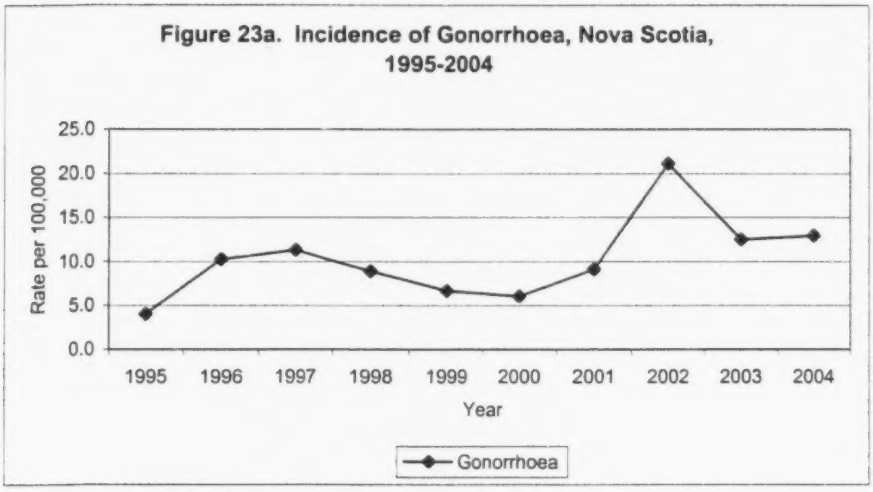


Figure 23b. Age-Specific Incidence of Gonorrhea, Nova Scotia, by Sex, 2004

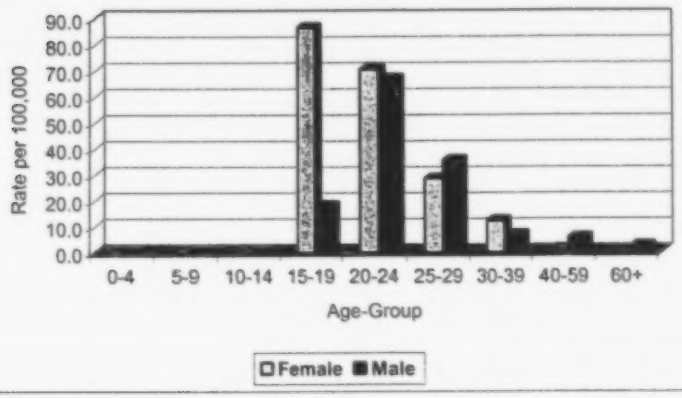
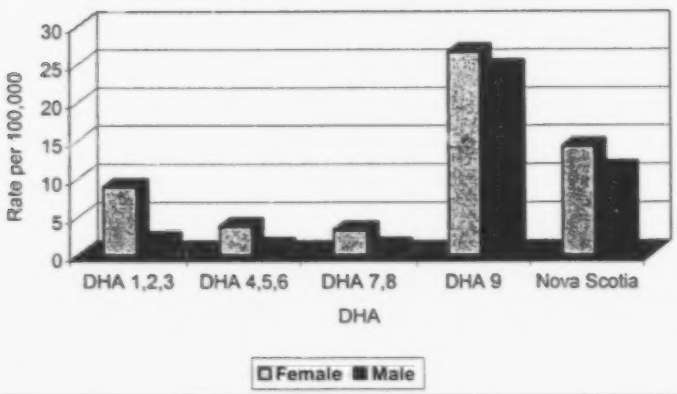


Figure 23c. Age-Standardized Incidence of Gonorrhoea, Nova Scotia, by Sex and District Health Authority, 2004



Hepatitis B (Acute / Chronic Carrier)

Hepatitis B is an acute or chronic infection caused by the Hepatitis B virus (HBV). Chronic infection is found in 0.5% of North American adults.[5] Risk varies inversely with age following acute infection and risk is also increased in immunocomprimised individuals.[8] HBV may be transmitted sexually, through household contact with an infected individual, perinatally from mother to infant, through injection drug use, and through nosocomial exposure.[5]

The incidence of acute HBV has declined since 1995 to one case per 100,000 in 2004 (Figure 24a). All cases in 2004 were diagnosed in individuals 25 years of age or older. Chronic HBV peaked at 5.5 cases per 100,000 in 1999 and declined to a rate of 2.3 cases per 100,000 by 2004 (Figure 24b).

In some populations, the risk of infection may be reduced by providing HBV vaccine (e.g. health care workers). Publicly funded vaccine programs are now offered in all provinces/territories to provide universal immunization against HBV. The age at which children and adolescents are offered the vaccine varies between jurisdictions.[8]

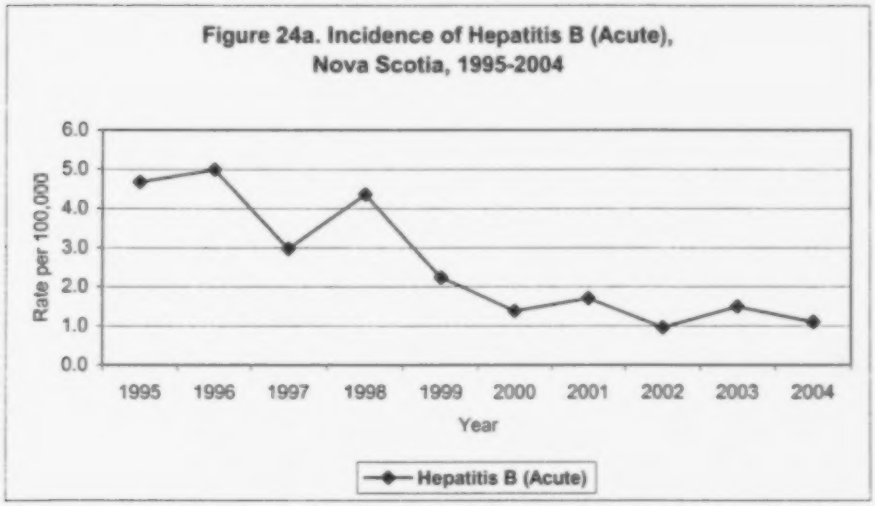
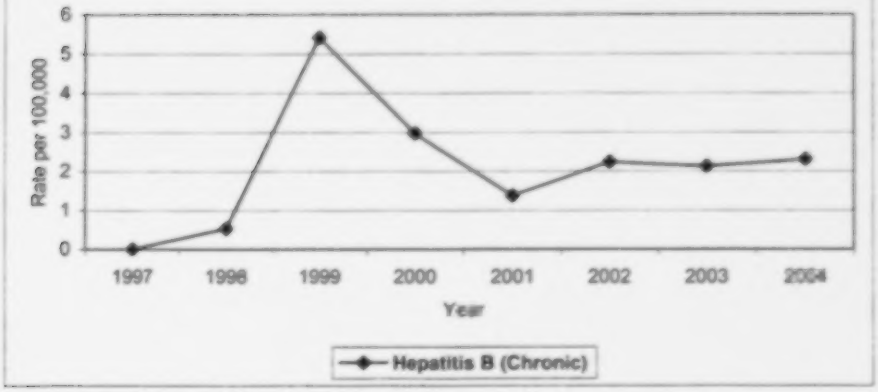


Figure 24b. Incidence of Hepatitis B (Chronic), Nova Scotia, 1997-2004



Hepatitis C

Hepatitis C is a viral infection caused by the Hepatitis C Virus (HCV). Transmission of HCV is commonly parenteral but sexual transmission has been documented to occur, however, far less efficiently than the parenteral route.[5]

Between 1995 and 2004, 2,989 cases of HCV were reported in Nova Scotia. As with testing for HIV, it must be remembered that the number of reported cases represents the number of positive test reports of those who have come forward for testing. As such, these numbers are not a reflection of the true incidence in the population. The rapid increase in rates in the mid-1990's may reflect the outcome of increased testing through programs implemented in Nova Scotia to identify, contact and advise the recipients of blood and blood products of their potential risk for disease. Since 1997, the number of positive test reports has continued to show an apparent decline to 226 cases diagnosed in 2004 (Figure 25a). The greatest proportion of cases reported over this 10-year period was diagnosed in males (68%) followed by females (31%) with 1% of unidentified gender. The greatest number of positive tests (74) were reported for males 40-59 years of age in 2004 (Figure 25b). DHAs 7 and 8 (Eastern) had the highest age-standardized rate of positive test reports that year at 30 per 100,000 population (Figure 25c).

Sixty percent of reported cases during 1995-2004 had follow-up risk factor information provided. Of these 1808 cases, injection drug use (IDU) was identified as a risk factor in 59%, receipt of tattoos in 36%, blood transfusion in 26% and sharing needles was reported as a risk factor in 32% of cases. Sexual risk factors were not included in this analysis.

Figure 25a. Number of Hepatitis C Positive Test Reports, Nova Scotia, 1995-2004

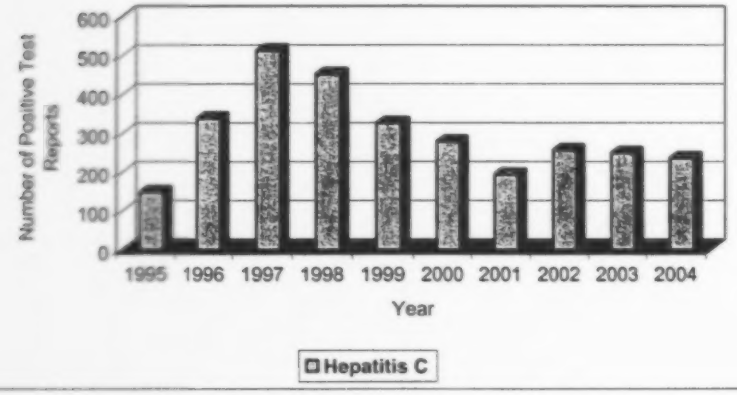


Figure 25b. Number of Hepatitis C Positive Test Reports, Nova Scotia, by Age-Group and Sex, 2004

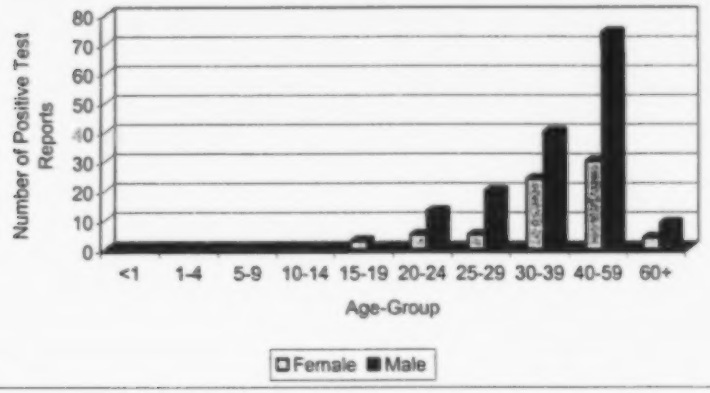
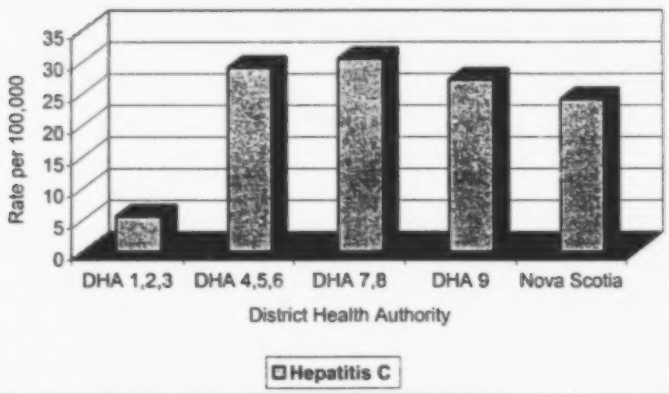


Figure 25c. Age-Standardized Rate of Hepatitis C Positive Test Reports, Nova Scotia, by District Health Authority, 2004



Syphilis

Syphilis is a bacterial infection that may be acute or chronic caused by the bacterium *Treponema pallidum*. It is characterized by a primary lesion, a secondary eruption that involves the skin and mucous membranes, lengthy periods of latency and late lesions of the skin, bone, viscera, central nervous system and cardiovascular system. Syphilis is transmitted sexually, transplacentally from a pregnant infected woman to the fetus and possibly through blood transfusion if the donor is in the early stages of infection.[5]

The incidence of early syphilis (primary and secondary syphilis) between 1995 and 2004 in Nova Scotia was relatively stable at less than 1 case per 100,000 population with the exception of 2003 and 2004. Rates may be showing an increasing trend. There were no cases reported in the province in 2001 (Figure 26a). Similarly, the incidence of "other" syphilis at less than one case per 100,000 between 1997 and 2000, was not reported in 2001 (Figure 26b).

Figure 26a. Incidence of Early Syphilis, Nova Scotia, 1995-2004

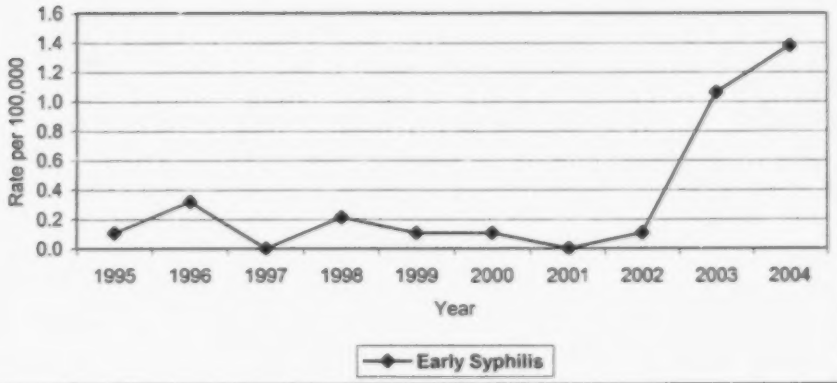
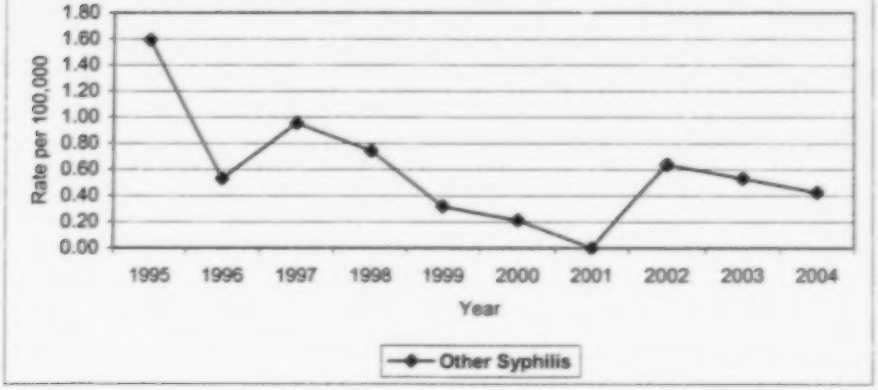


Figure 26b. Incidence of Syphilis (Other), Nova Scotia, 1995-2004



Section V

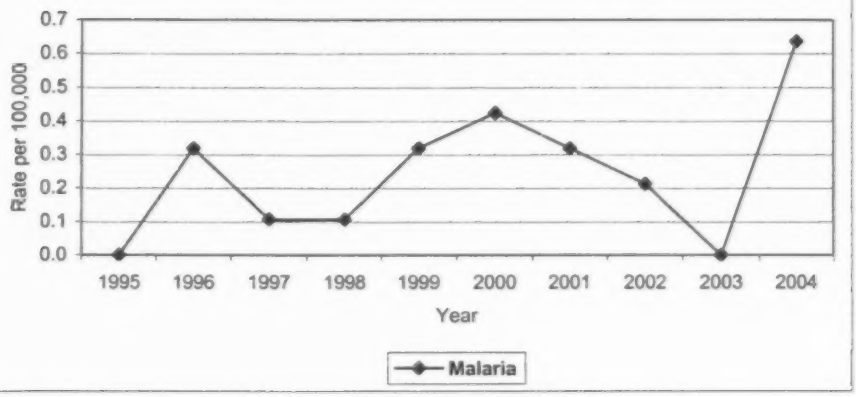
Vectorborne and Other Zoonotic Diseases

Malaria

Malaria is a parasitic disease acquired by infection with four possible human malarial parasites: *Plasmodium vivax*, *P. malariae*, *P. falciparum* and *P. ovale*. While the most serious infection is falciparum malaria, the other malarias are usually not life-threatening. Malaria is a major cause of illness in many tropical and sub-tropical areas and is transmitted by the bite of an infected female *Anopheles* mosquito. Areas of high transmission are found on the edges of forests in South America (e.g. Brazil), southeast Asia (e.g. Thailand and Indonesia) and throughout sub-Saharan Africa. Transfusion of blood from those infected or use of contaminated needles or syringes (injection drug users) may transmit the infection. Although congenital transmission is rare, stillbirth from mothers who have been infected is more common.[5]

Incidence of malaria in Nova Scotia has been exceedingly low with less than one case per 100,000 population between 1995 and 2004. It should be noted that these cases are travel-related (Figure 27).

Figure 27. Incidence of Malaria, Nova Scotia, 1995-2004



Lyme Disease

Lyme disease or Lyme borreliosis is a tickborne zoonotic disease caused by the bacterial spirochete *Borrelia burgdorferi*. It is often characterized by a distinctive skin lesion called "erythema migrans" and systemic symptoms. Neurologic, rheumatologic and cardiac involvement may also be present in varying combinations from months to years.[5]

There have been three cases of Lyme disease in Nova Scotia that were likely acquired in the province. Two of these cases were reported in 2002 and the third in 2004, all from Lunenburg County. Cases are also reported that were acquired during travel. There were five such reported cases in 2004, acquired in Europe or New England.

West Nile Virus

The West Nile Virus (WNv) is transmitted by mosquitoes that become infected by feeding on the blood of birds carrying the virus. The virus was initially isolated in 1937 in the West Nile province of Uganda and outbreaks have occurred in countries such as Egypt, Israel, South Africa and parts of Asia and Europe. The first North American outbreak occurred in the summer of 1999 in New York City and surrounding area. In Canada, the presence of the virus was first confirmed in September 2001 in birds in Ontario. The first human case was also confirmed in Ontario in September 2002.[13]

Surveillance activities first detected WNV in Nova Scotia in 2002 with four positive dead birds. In 2003, the virus was detected in 17 dead birds and one horse. Two travel-related human cases were also diagnosed that summer. In 2004, although surveillance activities were similar to those conducted in 2003, no WNV was detected in the province (testing of humans, dead birds (corvids), horses and mosquitoes). Cool weather was thought to contribute to the lack of WNV activity. Similarly, in Canada, activity was lower than it had been in the previous year, again believed to be due to weather conditions not conducive to the reproduction of mosquitoes and transmission of the virus.[14]

Rabies

Rabies is a neurotropic disease of viral origin that is vaccine-preventable. It presents clinically in humans as furious (agitated) and paralytic (dumb) rabies and is almost invariably fatal. Furious rabies is most common and is associated with hydrophobia and/or aerophobia and usually results in death within a few days of onset of symptoms. The clinical course for paralytic rabies is more protracted and is associated with local paresthesia and progressive flaccid paralysis.[15]

There has been a steady increase in the number of cases of animal rabies in Canada over the last few years with the majority of cases reported from Ontario and Manitoba. Bats, skunks and foxes are the most commonly infected animals. There were no positive reports of rabies in animals in Nova Scotia (laboratory and clinical) reported to the Canadian Food Inspection Agency in 2004, however a cat positive for rabies was reported in 2003.[16]

Despite the large numbers of cases of animal rabies, human rabies is rare in Canada. There have been 22 human deaths due to rabies since reporting was initiated in 1925.[8] No human cases were reported after 1985 until a nine-year old boy from Montreal, Quebec, died from rabies encephalitis

in October 2000[17] and a 52-year-old man from the greater Vancouver region died from undiagnosed rabies encephalitis in January, 2003.[18]

Section VI

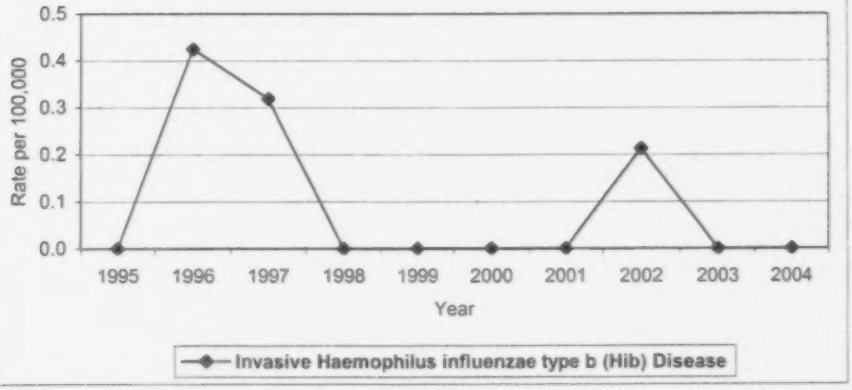
Diseases Preventable by Routine Vaccination

Haemophilus Influenzae Type b (Hib) Disease - Invasive

Prior to the introduction of Hib vaccines, *Haemophilus influenzae* b was not only the most common cause of bacterial meningitis, but it was also an important cause of other serious invasive infections in young children. Approximately 55% to 65% of those children affected had meningitis and the remainder had epiglottitis, bacteremia, cellulitis, pneumonia or septic arthritis. Otitis media, sinusitis, bronchitis and other respiratory tract disorders also are closely associated with Hib disease. An estimated 2,000 cases of Hib disease occurred annually in Canada prior to the introduction of the Hib conjugate vaccine in 1988. Since that time, the overall incidence of the disease has declined by more than 99%. Most cases now occur in those children who are too old to have undergone primary immunization.[8]

Since 1995, the rates of *Haemophilus influenzae* b have been extremely low at less than one case per 100,000 population (Figure 28). Cases were reported in 1996, 1997, and 2002 only.

Figure 28. Incidence of Invasive *Haemophilus influenzae* type b (Hib) Disease, Nova Scotia, 1995-2004

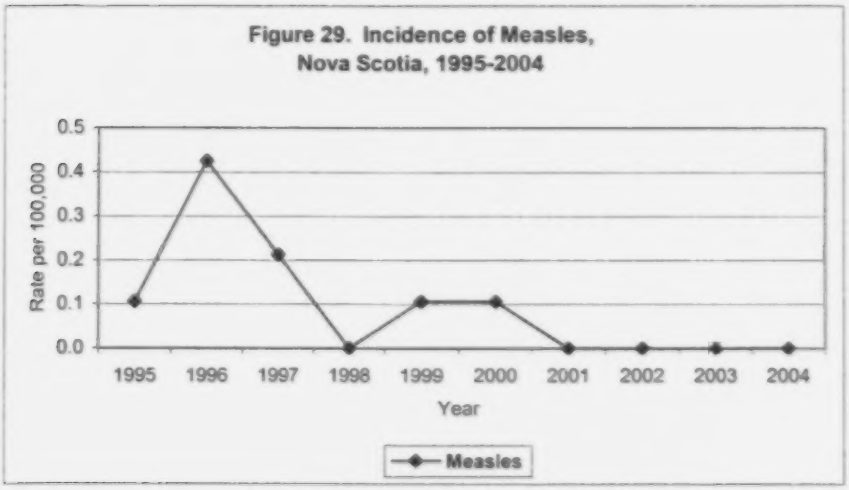


Measles

Measles or rubeola is the most contagious infection in humans that is vaccine preventable. Since the introduction of the vaccine, the incidence of measles has shown a marked decline in Canada and the two-dose schedule of immunization is further decreasing the proportion of children who are susceptible. Prior to the introduction of the vaccine, an estimated 300,000 to 400,000 cases occurred annually and occurrence was cyclical with incidence increasing every two to three years. Immunization for measles in Canada will continue to be necessary until the disease has been eliminated globally.[8]

Incidence of measles in Nova Scotia since 1995 has been very low with less than one case per 100,000 population reported (Figure 29). No cases were reported in 1998 and between 2001 and 2004.

Figure 29. Incidence of Measles, Nova Scotia, 1995-2004

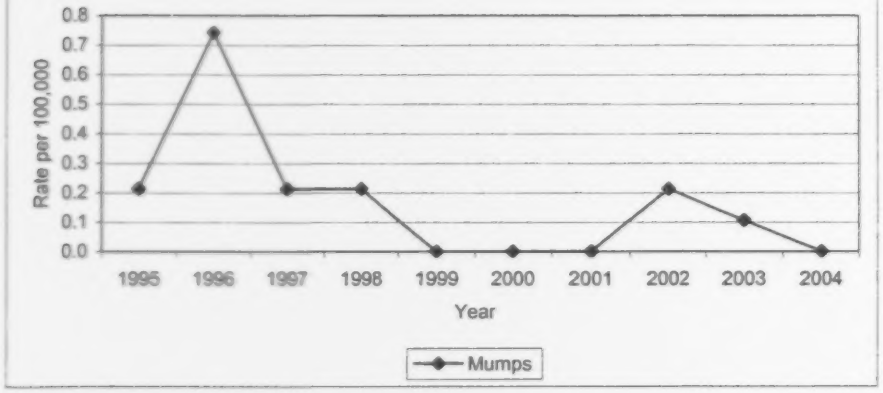


Mumps

Mumps or infectious parotitis is an acute viral disease transmitted through the air, by droplet spread or direct contact with the saliva of an infected individual.[5] Mumps was a major cause of viral meningitis prior to the extensive use of mumps vaccine. Since the vaccine was licensed in 1969, there has been a greater than 99% decrease in the reported number of cases of mumps.[8]

Less than one new case of mumps per 100,000 population has been reported since 1995 with no cases reported between 1999 and 2001 and in 2004 (Figure 30).

Figure 30. Incidence of Mumps, Nova Scotia, 1995-2004



Pertussis

Pertussis or whooping cough is a communicable acute bacterial respiratory infection caused by *Bordetella pertussis*. Transmission is commonly by airborne droplet infection usually by direct contact with discharges from respiratory mucous membranes of infected individuals.[5,8] Although any age may be affected, it is most severe among young infants. Reduction of incidence and morbidity of the infection among young children, therefore, is important. Although incidence has declined by more than 90% in Canada, outbreaks still occur.[8]

Following a peak in incidence in 1995 (43 cases per 100,000), the rate of newly diagnosed cases of pertussis has declined dramatically (Figure 31a). In 2004, 67% percent of reported cases were in children 14 years of age and less and the highest age-specific incidence was in children 4 years of age and less (Figure 31b). The highest age-standardized incidence occurred in DHA 9 (Figure 31c).

Figure 31a. Incidence of Pertussis, Nova Scotia, 1995-2004

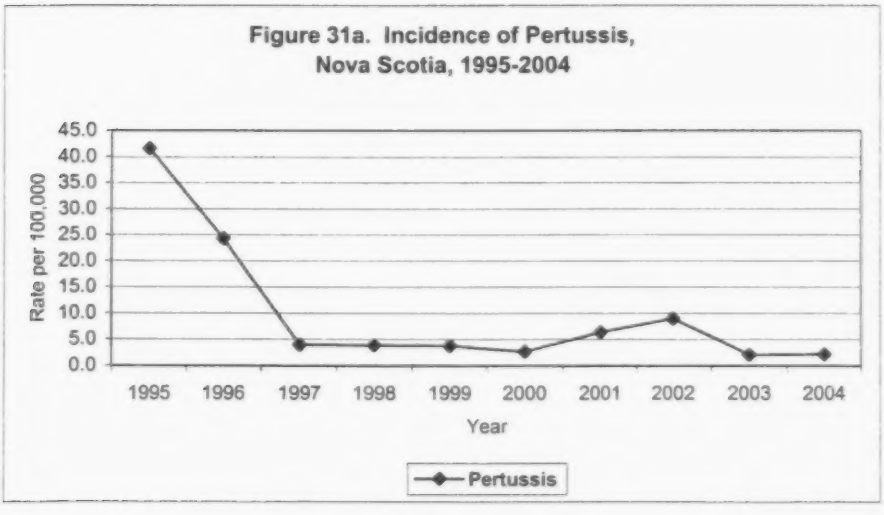


Figure 31b. Age-Specific Incidence of Pertussis, Nova Scotia, 2004

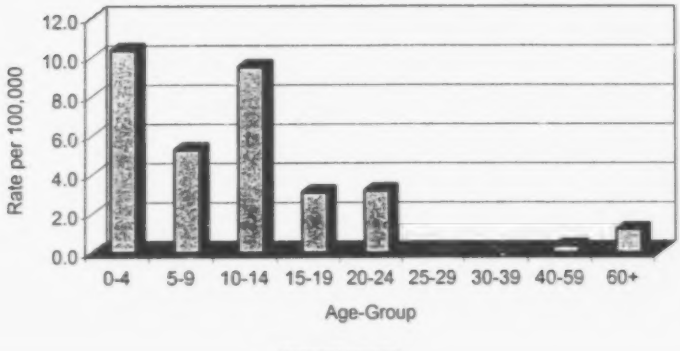
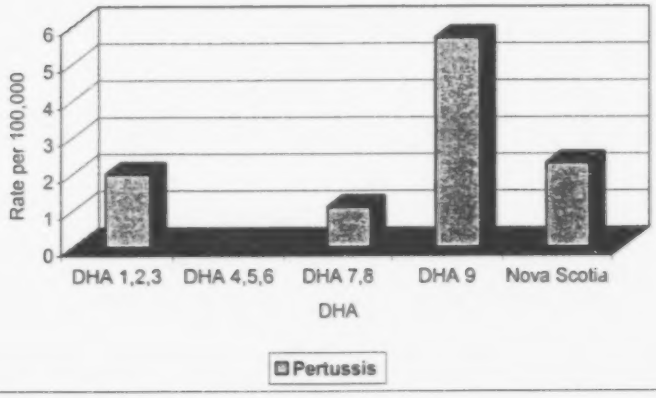


Figure 31c. Age-Standardized Incidence of Pertussis, Nova Scotia, by District Health Authority, 2004

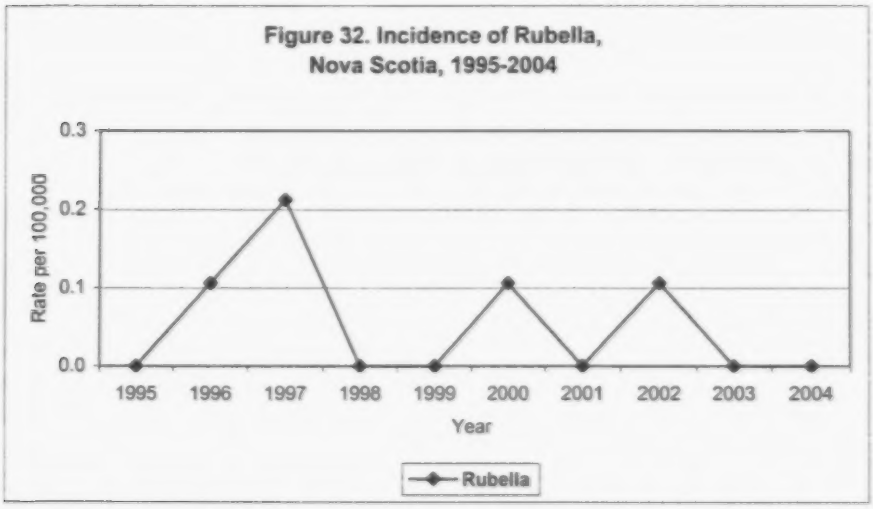


Rubella

Rubella is a viral disease causing a mild, febrile illness. Transmission is through contact with nasopharyngeal secretions, direct contact with infected patients and by droplet spread. An immunization program for measles, mumps and rubella (MMR) directed to infants was introduced in Canada in April, 1983. The main goal of immunization is the prevention of infection in pregnancy and thus prevention of the potential development of congenital rubella syndrome (CRS).[5,8]

The incidence of rubella in Nova Scotia since 1995 has remained below 1 case per 100,000 population. No new cases were reported in 2003 and 2004. (Figure 32).

Figure 32. Incidence of Rubella, Nova Scotia, 1995-2004

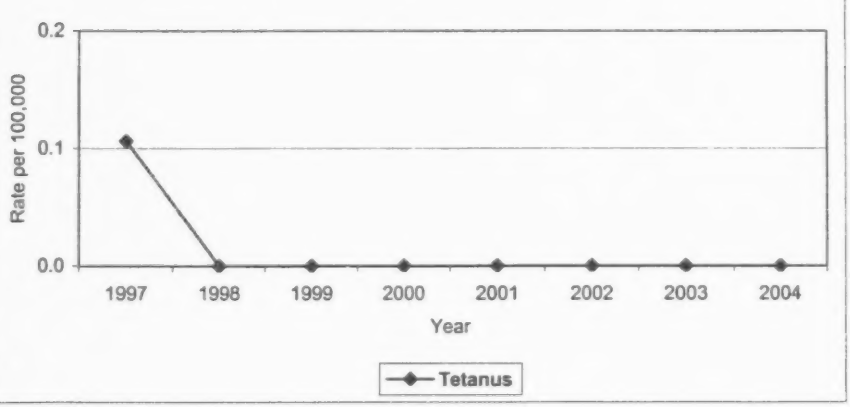


Tetanus

Tetanus is an acute disease caused by an exotoxin produced by the tetanus bacillus, *Clostridium tetani*, that grows at the site of injury in the absence of oxygen. Although it is worldwide in occurrence, it is sporadic and usually uncommon in industrialized countries. The disease is transmitted by spores produced by the bacillus that are introduced into the body commonly through a contaminated puncture wound (e.g. from soil, street dust, animal or human feces), lacerations, burns, seemingly minor wounds or by injection of contaminated street drugs. Growth of the pathogen is favoured by necrotic tissue and/or foreign bodies.[5]

No cases of tetanus have been reported in Nova Scotia since 1997 (Figure 33).

Figure 33. Incidence of Tetanus, Nova Scotia, 1997-2004



Section VII

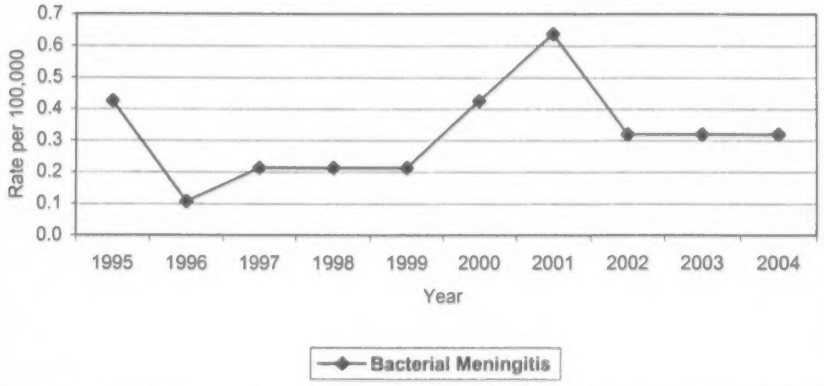
Other Diseases

Bacterial Meningitis

The most common agents causing bacterial meningitis as of the late 1990's were *Neisseria meningitidis* and *Streptococcus pneumoniae*. In the United States, *Haemophilus influenzae b* was one of the most common causes of bacterial meningitis but has been essentially eliminated following the introduction of Hib vaccine. Other less common bacteria (staphylococci, enteric bacteria, group B streptococci and listeria) may lead to bacterial meningitis in individuals with particular susceptibilities.[5]

The incidence of bacterial meningitis (caused by other than *N. meningitidis, S. pneumoniae,* and *Haemophilus influenzae* b) has remained consistently low in Nova Scotia since 1995 at less than one case per 100,000 population (Figure 34).

Figure 34. Incidence of Bacterial Meningitis, Nova Scotia, 1995-2004

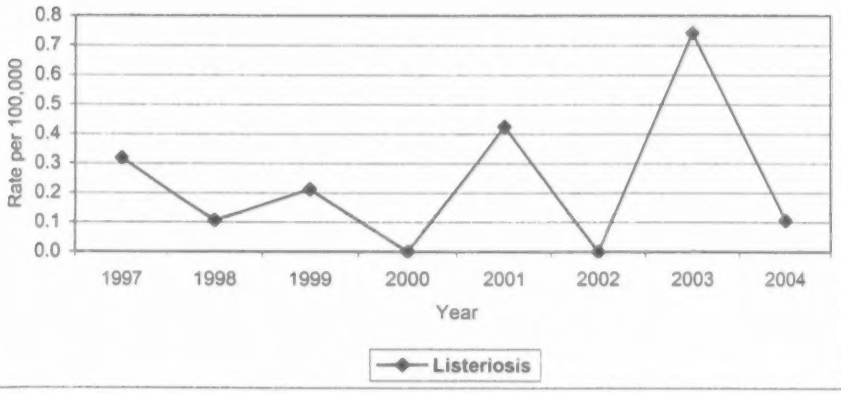


Listeriosis

Listeriosis is a bacterial disease commonly manifested as meningoencephalitis and/or septicaemia in both newborns and adults and as fever and abortion in pregnancy. Transmission is through direct contact with infected material or through neonatal infection where the infection may be passed to the fetus in utero or during birth through the birth canal. Outbreaks have been reported associated with consumption of raw or contaminated milk, soft cheeses, vegetables and pâté.[5]

The incidence of listeriosis in Nova Scotia has remained consistently low since 1997 at less than one case per 100,000 population (Figure 35).

Figure 35. Incidence of Listeriosis, Nova Scotia, 1997-2004



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